ABSTRACT

THE EFFECT ON WEIGHT REDUCTION OF COVERANT CONDITIONING THROUGH A SELF-MANAGEMENT APPLICATION OF THE PREMACK PRINCIPLE

By

John Joseph Horan

The purpose of this study was to determine the effect on weight reduction of coverant conditioning through a self-management application of the Premack principle. Coverants (a contraction of "covert operants" coined by Homme) are mental behaviors such as thoughts, images, feelings, reflections and so forth. An adaptation of the Premack principle--"For any pair of responses the more probable one will reinforce the less probable one"--provided a methodology through which certain coverants were reinforced.

It was hypothesized that counseled clients who received training in a particular type of coverant conditioning would exhibit greater weight loss at the end of an eight-week period than would counseled and noncounseled clients who did not receive such training.

Ninety-six female volunteers, mostly coeds between 20% and 30% overweight, were impartially assigned to one of four treatment groups. The first was delayed treatment control; the second was a placebo or "typical" treatment control. In Groups 3 and 4 an attempt was made to increase the frequency of coverant pairs which individual subjects identified as being incompatible with their over-eating habits. Negative coverants involved the undesirable aspects of being overweight

(e.g. "a shortened life span"). Positive coverants involved the desirable aspects of being properly proportioned (e.g. "clothes fitting better").

Group 3 was exposed to a scheduled coverant treatment designed to determine the necessity of invoking the Premack principle by omitting it as a reinforcement methodology. These subjects were simply told to think of the negative-positive coverant pairs at least seven times a day. Group 4 received training in coverant conditioning through a self-management application of the Premack principle. These experimental subjects were helped in identifying a specific highly probable behavior (i.e. a non-eating activity occurring at least seven times a day, such as "sitting down on a particular chair"). They were then instructed to make the emission of this behavior contingent upon the thinking of a negative-positive coverant pair.

All subjects were given the opportunity for a free physical exam prior to undergoing counseling. Those in Groups 2, 3, and 4 received a booklet containing information on obesity, a diet plan, and three individual counseling sessions lasting ½ hour each (the second and third session followed the first by one and eight weeks respectively). Those in Group 1 were told that due to a large number of applicants and a limited staff, their scheduling would have to be delayed. Pre- and posttreatment weights were taken at the same time of day in street clothes minus shoes, on a physician's scale to the nearest quarter-pound.

After eight weeks the mean weight losses for Group 1 (Delayed Treatment), Group 2 (Placebo Treatment), Group 3 (Scheduled Coverant

Treatment), and Group 4 (Reinforced Coverant Treatment) were +0.02, -3.13, -2.72, and -5.66 pounds respectively. Using an analysis of covariance design with pretreatment weight as the covariate, Group 4 lost significantly more weight than did Group 1 ($p < .03$). All other pairwise comparisons were not significant.

In Groups 3 and 4 the frequency of experiencing coverant pairs was inversely related to weight differential (Pearson $r = -.27$). Both groups exhibited rapidly declining coverant pair frequency rates during the course of treatment. But on an overall basis, Group 4 experienced significantly more coverants than did Group 3 ($p < .05$).

Coverant conditioning appears to be a viable therapeutic adjunct. However, the applicability of the Premack principle in a self-management situation was not established.

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Theories exist in science because they are useful. There is no pretense that they are in any other sense "correct" (Logan & Wagner, 1965, p. 104).

CHAPTER I: RATIONALE

Introduction

Coverant conditioning is a generic term referring to the principles and procedures underlying the modification of mental behavior. Coverants (a contraction of "covert operants" coined by Homme in 1965) are mental behaviors such as thoughts, images, feelings, reflections, and the like. An adaptation of the Premack principle--"For any pair of responses, the more probable one will reinforce the less probable one (Premack, 1965, p. 132)"--suggests a methodology through which certain coverants might be reinforced.

Two studies (Stuart, 1967 and Harris, 1969) employed different forms of coverant conditioning as part of an overall treatment program designed to produce weight loss. Both reported considerable success insofar as reducing the weight of the participants was concerned. Neither, however, established the efficacy of coverant conditioning as a therapeutic adjunct. Such was not their intent. So in an experimental sense it is still not known whether coverant conditioning was an integral or superfluous component in either of the fairly complex treatment programs.

Purpose

In contrast to the Stuart and Harris projects, the major concern of this experiment was to determine the therapeutic effect of

a particular type of coverant conditioning. Overeating was selected as a neurotic paradigm simply out of convenience; the outcome measure of weight loss is indisputable. Hence, the task of developing a comprehensive and marketable method of weight reduction was not undertaken.

Should coverant conditioning prove to be a viable therapeutic technique in this study, then similar procedures could easily dovetail with any existing weight loss program. Furthermore, if coverant conditioning can be shown to alter maladaptive eating habits, then the implications for using this technique in the treatment of other behavior disorders would be greatly enhanced.

Specifically, the primary purpose of this study was to investigate Homme's (1965) contention that coverants of overweight counseling clients which are incompatible with overeating can be reinforced through the use of a self-management application of the Premack principle, thereby effecting weight loss.

The success of Homme's approach to the treatment of obesity actually rests upon two interlocking assumptions.

1. A high frequency of theoretically "incompatible" coverants will, in fact, interfere with overeating.
2. The Premack principle is applicable in a self-management situation.

Therefore, the secondary purpose of this study was to examine the tenability of these assumptions. It was hypothesized that:

1. Counseled clients who receive training in a particular type of coverant conditioning will exhibit greater weight loss at the end of an eight week period than will counseled and non-counseled clients who do not receive such training.
2. The frequency of experiencing incompatible coverants will be inversely related to weight differential.

3. Clients who attempt to reinforce their coverants through the use of a self-management application of the Premack principle will experience more coverants than will clients who attempt to follow a predetermined coverant frequency schedule.

Theory and Supportive Research

The Problem of Obesity

Obesity occurs only when caloric intake consistently exceeds caloric expenditure. People differ from each other insofar as their minimum food requirements are concerned; for example, lumberjacks must consume more than fashion models in order to survive. Furthermore, the daily caloric needs of a given individual may vary with the climate, his activity level, and a host of other factors. But obesity can occur only when one consistently exceeds his own particular food requirements.

Why some individuals consume much more than their energy needs demand, and consequently become obese, is a topic that has been subjected to a vast amount of speculation and research. Even a cursory bibliography of the area could comprise a volume in itself. No one doubts that the direct cause of obesity is overeating, but traditional theories about the cause of overeating range from the strictly somatic to the purely psychodynamic points of view.

Advocates of the biochemical basis of obesity hypothesis have generally looked to studies of laboratory animals in support of their theories. Genetic determinants of obesity in certain strains of mice are well known (Danforth, 1927; Rytand, 1943; Mayer, 1953). Furthermore, hypothalmic lesions surgically induced or produced through massive doses of gold thioglucose can precipitate a tendency to

overeat (Brobeck, et al., 1942; Miller, et al., 1950; Anliker & Mayer, 1956; Mayer, 1953, 1968). Since the etiology of overeating in some experimental animals can be definitely traced to different and specific somatic sources, organic analogies have been cautiously drawn to cover humans as well (Stunkard, 1959a; Mayer, 1968).

A concise but comprehensive account of the physiological factors underlying obesity was published by Mayer in 1968. He used a four-way classification scheme (genetic, hypothalmic, other CNS, and endocrine) to present the numerous known organic origins of obesity in mice, rats, dogs, monkeys, farm animals, and man. In humans no less than thirty somatic sources were detailed.

It should be kept in mind, however, that physiological factors cannot cause obesity. At most, they can only predispose some individuals to overeat. And if overweight humans or lower animals (including those with identified organic debilities) can be made to adhere to a diet reasonable to their energy needs, they will in fact lose weight (Hamburger, 1951).

Furthermore, the usual case of obesity is rarely complicated by any known biochemical disposition to overeat. It is conceivable that the failure to isolate possible somatic agents might be attributable to the relative youth and imprecision of the physiological sciences. Mayer (1968), for example, has suggested that slight, as yet undetectable, organic factors underlying a difference in caloric intake of only a few percent could result in substantial weight gain over the years. However, until these hypothetical entities are made measurable, "a priori" reasoning should not be substituted for established law. The vast majority of overweight individuals are

physiologically normal except for occasional complications caused by the obesity itself.

Finally, since physiological theories concerning the etiology of overeating have been somewhat less than satisfactory, as might be expected, efforts to treat or control the problem on a strictly biochemical basis have proved to be conspicuously unsuccessful. An increasing number of amphetamine drugs are continually being developed. However, the editors of Consumers Reports (1963) have indicated that:

> ...tolerance to these drugs is easily acquired, and after a period of several weeks or months, even increased doses lose their effectiveness altogether.
>
> In one careful five year study...results in patients treated by diet alone compared favorably with results in patients treated with a combination of diet and amphetamine drugs (p. 111).

Similar conclusions were reached by Silverstone and Solomon (1965), Lynn (1969), and Ryan (1970).

In well documented reviews of the medical literature, several authors (Richardson, 1946; Hamburger, 1951; Mendelson, 1966) have emphasized the irrelevance of organic factors in the etiology of the usual case of obesity. Instead, they have argued that the state of being overweight is a manifestation of neurosis, and have opted for formulations of a psychodynamic nature. But published reports authoritatively listing the dynamic causes of obesity are legion (see, for example, Fenichel, 1945; Szczek, 1955, 1957; Bruch, 1957; Kaplan, 1957; or Simon, 1963). Brosin's (1953) symbolism summary typifies this approach:

> ...the enlarged body may represent a fortress-like defense against a hostile world, a symbol of independence, importance and prowess, an intimidation to enemies, a symbol for a wished-for pregnancy, a means of discouraging suitors, a mask for emotions or a socially acceptable justification for underactivity that permits the person to take fewer risks and thus helps keep anxiety low (p. 975).

The dynamic equation of oral frustration and affective starvation leading to caloric oversatiation is another recurring etiological theme. However, this parable and other "post hoc" explanations of the problem have proven to be grossly inadequate insofar as predicting which individuals will become obese. As Stunkard (1959a) noted:

> Indeed it has not even been possible to define the psychological characteristics of obese persons which will consistently distinguish them from non-obese persons (p. 292).

And as far as dynamically oriented approaches to treatment are concerned, be they individual or group, intensive or superficial, an oft quoted observation of 1958 rings true today:

> ...most obese persons will not stay in treatment for obesity. Of those who do stay in treatment most will not lose weight, and of those who do lose weight, most will regain it (Stunkard, p. 79).

Since a scientific theory holds no value beyond its functional utility, the impotence of such armchair speculation (of a psychodynamic nature) in the generation of effective treatment programs renders it somewhat less than worthless, at least as far as the study of obesity is concerned.

Learning Theory, a Possible Solution

The role of food (and hence eating) in the learning laboratory has traditionally been that of a reward or reinforcer (i.e. something

which increases the frequency of a preceding response). Food pellets have been given to rats that have pulled certain levers, pigeons that have poked particular keys, chimps that have opened desired doors, and humans who have exhibited various and sundry socially appropriate behaviors. So while the reinforcing capacity of food is well known, little attention has been paid to the possibility that eating behavior itself may be capable of being reinforced.

Through an ingenious series of experiments, Premack (1959, 1962, 1965) has shown that eating and drinking are both reinforcing and capable of being reinforced. In one study (1962) the drinking behavior of rats was reinforced by rewarding them with the opportunity to run, and conversely running behavior was reinforced by rewarding the rats with the opportunity to drink. Using children in an earlier study, Premack (1959) showed that the opportunity to operate a pinball machine could reinforce the eating of candy and vice versa.

Premack's primary purpose in conducting these experiments was not to shed more light on the study of eating behavior "per se." But rather he was attempting to reformulate some deeply entrenched, yet unproductive notions about the nature of reinforcement. (Premack's principle of reinforcement will be explored more fully in the following section of this chapter.) In any event, Premack has shown, even if only by implication, that consummatory responses are not solely the result of innate biochemical or psychological drives. Eating and drinking base rates are subject to the same modification by environmental consequences as any other operant pattern.

A concise review of other research illustrating the relationship

between obesity and environmental factors was presented by Albert Stunkard in a recent seminar sponsored jointly by the Department of Psychiatry and the Institute of Nutrition at Michigan State University. Stunkard's talk was an elaboration of a paper he published in 1968 which summarized the contributions of sociology, social psychology, and experimental psychology to the understanding of obesity.

In his review of a number of studies, particularly the work of Hollingshead and Redlich (1958), Nisbett (1968), Schachter (1967), Ferster, et al. (1962), Stuart (1967), and himself, Stunkard pointed out that:

1. Parental socioeconomic status and ethnic background are striking examples of social factors whose relationship to obesity is not only correlative, but also causative. (Stunkard's reasoning behind this latter claim is admittedly tenuous.)

2. The eating behavior of obese humans parallels that of experimentally obese animals. Environmental influences such as the availability of food, the palatability of food, and the time of day, dictate the eating behavior of overweight subjects to a far greater extent than subjects of normal weight. Conversely, with obese subjects as compared to non-obese subjects, there is a complimentary decrease in the control of eating by internal factors (in the central nervous system).

3. Behavioral techniques in the treatment of obesity and anorexia nervosa have proved to be highly successful.

The indisputable fact that eating behavior can be modified by its consequences provides the basis for a learning theory-oriented explanation and treatment of the obesity phenomenon. To a behaviorist the usual case of obesity might be defined as nothing more than the end result of a series of maladaptive eating habits. No biochemical propensities need be found; no colorful psychodynamic

determinants need be invoked.

Similarly, the emaciated state of individuals commonly diagnosed as having anorexia nervosa might also be defined as nothing more than the end result of a different series of maladaptive eating habits. The former syndrome would of course involve overeating, the latter, undereating. (Conceptual parsimony here is not meant to imply that extreme cases in either syndrome are free from serious physical or behavioral disturbance.)

Overeating is really a generic term which can include any one of a number of individually identifiable maladaptive eating habits. The following undesirable habits were developed principally from the work of Ferster, et al. (1962) and Stuart (1967). This list is certainly not exhaustive.

1. Storing easily-eaten food
2. Eating rapidly
3. Eating everything on the plate
4. Combining eating with other activities
5. Eating when anxious
6. Eating when lonely or depressed

An illustration and explanation of how these individual habits contribute to the gaining of weight can be found in the booklet Sense and Nonsense About Obesity (see Appendix H).

The use of the term "maladaptive" applied to such seemingly innocuous activities as "eating rapidly," might at first blush seem unwarranted. In some cultures, particularly those in which a paucity of food is to be found, the whole spectrum of habits implied by the concept of overeating could be very adaptive indeed. Even in this

country the person of normal weight who consistently "eats everything on his plate" is hardly guilty of engaging in a self-defeating activity. However, in view of the indisputable health hazard brought on by excessive overweight (see Hundley, 1955, or Keys, 1955), the seriously obese individual who knowingly sustains his condition by not attempting to extinguish any one or more of these habits is certainly exhibiting "maladaptive" behavior.

Insofar as the behavioral treatment of obesity is concerned, identifying the complex interaction of events which precipitated the particular maladaptive habit system of a given individual is not at all essential. "Post hoc" speculation about possible etiological agents (mother or father, positive or negative reinforcement, fixed or variable schedules, etc.) is of only academic utility. Premack's work (1959, 1962) implied that the laboratory production of overeating habits would be a relatively simple task which could be accomplished in a number of ways. The behavioral counselor is primarily concerned with the identification of the maladaptive response (problem clarification). From this vantage point he is free to employ a variety of techniques based on learning theory, in an effort to eliminate the undesirable activity.

Changes in eating habits, however, are very difficult to effect. One reason the problem exists in the first place is that the aversive consequences of overeating (namely, becoming obese and all that is implied by such a condition) are delayed for months or years. The overweight individual is simply not aware of the fact that he has gained weight until a long time after he has overeaten. Even then he is probably not really sure of the particular maladaptive

eating modes that preceded his obesity.

Furthermore, the positive reinforcement for alterning one's undesirable eating behavior is also delayed for a long period of time. The overweight individual does not notice a loss of weight until a long time after he ceases to overeat. And mere habit alteration (e.g. eating more slowly) is not sufficient; to lose a substantial amount of weight one must nearly refrain from eating. Dieting causes real and immediate physical discomfort which may not be offset by the miniscule reward of losing ideally a pound or two per week.

Finally, unlike alcoholism and other addictions, the source of the obesity problem--food--cannot be entirely avoided. Survival demands repeated exposure to tempting stimuli.

To recapitulate, theories are useful only insofar as they provide understanding of a phenomenon and function in a predicting and controlling capacity. Traditional views of obesity as being the result of biochemical or psychodynamic factors have proved unsatisfactory in every respect. Learning theory has provided a clear and consistent etiological explanation of the eating disorders. Its utility in the formulation of treatment programs will be discussed in the following three sections of this chapter.

The Premack Principle and Contingency Management

In the science of operant conditioning the construct "positive reinforcement" has traditionally been indistinguishable from the lay concept of a reward. Mice in a Skinner box will pull levers because this activity has been "reinforced" with meal pellets;

house pets will sit on command because the performance of this trick has been "rewarded" with a bit of food. In this sense, a reinforcer has been viewed as something which can bring about a new behavior (through shaping), or something which can modify the frequency of an already existing response.

Reinforcers have been said to obtain their power from biological or psychological needs. In other words, the subject is driven to act in a particular manner because he has observed that the emission of this response will bring about something (the reinforcer) which in turn will reduce a specific need. Since humans have been ascribed more sophisticated needs than lower animals (Maslow, 1943, 1954), intangible things such as a smile or a word of praise can also function as reinforcers. But in the vast array of learning theory experiments, the most commonly employed reinforcers are probably food and water.

When Premack (1959, 1962, 1965) showed that eating and drinking could not only reinforce other behaviors but were also in themselves capable of being reinforced, he was attempting to render obsolete traditional elements of learning theory. The drive reduction model was seen as inadequate because the discovery of each new reinforcer--"lights, sounds, puzzles where a moment ago there had been only food (1965, p. 132)"--forced the positing of additional drives.

In an exposition on instrumental learning, for example, Morgan (1961) defined reinforcement as:

> ...the presentation of an incentive satisfying a physiological motive immediately following the instrumental response (p. 684).

His physiological definition then had to be expanded to include

"curiosity and exploratory drives" when such were found to reinforce other responses.

In order to eliminate such conceptual redundancy, Premack (1965) has reformulated the construct of reinforcement:

> ...reinforcement involves a relation, typically between two responses, one that is being reinforced and another that is responsible for the reinforcement. This leads to the following generalization: of any two responses, the more probable response will reinforce the less probable one (p. 132).

Premack has thus shifted the emphasis from the reinforcing stimulus (the tangible "thing") to the reinforcing event. If food functions as a reinforcer, it does so only because the experimenter has previously denied the subject the opportunity to eat, that is, kept him in a state of partial starvation. Eating has therefore become a highly probable behavior (HPB). The response to be reinforced is called a lowly probable behavior (LPB). Should the opportunity to engage in an HPB be made to depend upon the emission of an LPB, the former will reinforce the latter. Such a process is called "contingency management." A hungry rat will press a bar, pull a string, or push a marble into a hole (all LPB's) in order to be fed (an HPB). If the contingencies are managed correctly, then the desired LPB will soon become highly probable.

On the other hand, if the probability of eating is very low or zero, as might be the case with a totally satiated subject, then food will no longer function as a reinforcer. Should the contingency manager wish to increase the frequency of eating behavior in this case, he must first identify a functional HPB and then make the emission of this activity depend upon the occurrence of eating,

now the LPB. Hence, the familiar parental dictum, "Finish your dinner, then you can go out and play" has found a home in modern reinforcement theory!

Homme and his associates have reported a number of studies which successfully employed the Premack principle in the reinforcement of adaptive activities. With a group of nursery school children Homme & Tosti (1965) made the HPB of running down the hall contingent upon the emission of counting and consequently shaped counting behavior. And by using such unanticipated HPB's as pushing the experimenter around the classroom on a chair equipped with casters, a number of active three year olds were trained to sit quietly in a chair, focus on the blackboard, and learn to recognize various letters of the alphabet (Homme, et al., 1963; Homme, 1966a). In another study (Homme, 1966a), a group of high school dropouts completed a course in reading and math by making a coffee or cigarette break depend upon finishing a specified number of programmed learning frames (the LPB).

The number of possible HPB's appears infinite, limited only by the contingency manager's ingenuity. One of Homme's associates, for example, noticed that at their first meeting, a young blind girl grabbed his hand and smelled it. The youth had been mute ever since her entry into a mental hospital. Instantly, the researcher recognized a functional HPB. He withheld his hand until the girl began to make some sounds. These were soon shaped into syllables, words, and sentences. Within a month the youngster had a 200 word vocabulary (Homme, 1966a).

Contingency management has also been used in the treatment of

anorexia nervosa. Stunkard (1968, 1970) and his associates, for example, observed that such patients exhibit a striking amount of hyperactivity. Hence, they were restricted to their rooms and rewarded with passes only if their weight had increased by a half-pound from the preceding day. Each patient subsequently responded with rapid and consistent gains in weight which continued after their discharge from the hospital. A Homme-Premack analysis would probably label eating as an LPB which soon became highly probable when the opportunity to leave the room (an HPB) was made contingent upon gaining weight.

It should now be apparent that any successful example of positive reinforcement can be neatly fitted into Premack's reformulation, even though the original researcher may have been operating out of a more traditional frame of reference. But the Premack principle accounts for a much broader range of events. According to Homme (1966b), it implies that "any behavior can reinforce any lower probability behavior (p. 234)."

In the studies reviewed up to this point, the experimenter has served as the contingency manager. It remains to be seen whether the Premack principle is really applicable in a self-management situation.

Coverant Conditioning and the Treatment of Obesity

The human personality consists of cognitive, affective, motor, and somatic behaviors. In years gone by learning theorists have ignored or denied the existence of the first two types of behavior, concentrated on the third, and abandoned the fourth to the science

of physiology. Thus there exists a plethora of strategies for the production, maintenance, and elimination of maladaptive motor behavior, particularly the motor behavior of animals. From whence comes the cynical observation that every white mouse in captivity has, at least potentially, the opportunity to enjoy mental health.

Human beings are not so fortunate; unlike the "albus rattus" their problems in living often involve a considerable amount of ideational material (cognitive and affective behaviors). And the behavioral therapies have been severely criticized for tending to ignore this fact. These mental behaviors may be called "coverants," a contraction of "covert operants" coined by Homme (1965). But only the name, not the concept is new; coverants have been previously identified as inner responses, inner states, or private events. Though coverants obey the same laws as operants (Dollard & Miller, 1950; Skinner, 1953, 1957; Homme, 1965), the great weight of learning theory has pressed little for the prediction and control of such mental activity, and focused instead on the enormous tasks of defining these events physically, chemically, and electrically.

Two partial exceptions to this generalization are, of course, desensitization and implosion, which deal with imagery at given points in the therapeutic hour. However, all of this covert activity is directly elicited by the counselor. Though there may be some accidental "spill over," no provision is made for the client to systematically carry any of these mental behaviors beyond the confines of the counseling office. Learning theory has had little to offer the therapist in terms of modifying the covert activity of an individual engaged in the daily affairs of life. Such would

include techniques for altering the frequency of particular thoughts, images, fantasies, ruminations, and so forth.

In an important series of papers, Homme (1965, 1966b; Homme & Tosti, 1965) has founded a technology for the control of coverants. The problem of covert response detection was dismissed with an extremely simple observation:

> Each S is a highly sophisticated computer when it comes to discriminating the occurrence or non-occurrence of a behavior in himself. Whether he is thinking about a chair or thinking about a table is a simple discrimination which he can make with great reliability (Homme, 1965, p. 503).

Homme (1965) then suggested that coverant frequency can be increased through a self-management application of the Premack principle. Simply let the subject himself make the emission of an HPB contingent upon the occurrence of a desired coverant. In Homme's words:

> If there should be any reason for strengthening this coverant, it can easily be done. All that is required is that S, to whom it is private, demand that it occur immediately prior to the execution of some momentarily high probability behavior (pp. 504-505).

In all of the research projects reviewed prior to this point, the experimenter acted in the role of contingency manager. He made the opportunity to engage in an HPB depend upon the occurrence of the desired response (the LPB). Now Homme has argued that Nature doesn't care who arranges the contingencies between lower and higher probability behaviors (Homme & Tosti, 1966). The client is perfectly capable of serving as his own contingency manager. This would apply not only to the manipulation of motor behaviors but also to the reinforcement of mental activity as well.

The conditioning of coverants has strong theoretical implications for the treatment of a number of personal behavior problems, particularly obesity (overeating). Upon request, most overweight individuals are able to think of a number of reasons for losing weight. These reasons may be highly idiosyncratic insofar as rank order of importance is concerned; they may also be of a negative or positive nature. For example, some overweight individuals may find the thought of "a shortened life span" more aversive (negative) than the idea of "diminished sexual attractiveness." Similarly, others may find the prospect of "clothes fitting better" more desirable (positive) than the fantasy of "running up a flight of stairs without getting tired."

These reasons for losing weight can be viewed as a class of coverants. Because of their anxiety arousing potential they are undoubtedly lowly probable. If the frequency of such coverants which are "incompatible" with overeating (or the state of being obese) can be increased by making an HPB contingent upon their occurrence, then the incidence of maladaptive eating should consequently decrease, thereby producing a measurable decline in the client's weight.

Homme has never elaborated on the concept of "incompatibility." Nor has he provided a satisfactory explanation as to why he feels eating behavior itself cannot be used as an HPB. Several theoretical models might be invoked to explain the impact of coverant control on motor behavior; the latter point, however, is still researchable.

Incompatibility as cognitive dissonance. According to Festinger

(1957), dissonance between two cognitions is psychologically distressing. This relationship exists when "...the obverse of one element would follow from the other (p. 13)." Individuals experiencing such a disparity are motivated to seek a state of consonance, which can be achieved by making one's behavior consistent with one's thoughts or vice versa. It therefore follows that overweight clients cannot entertain anti-obesity coverants along with "obverse" cognitions which sanction continued overeating, without experiencing considerable dissonance. The former will either remain lowly probable, or if reinforced, will precipitate a change in eating behavior.

Incompatibility as reciprocal inhibition. Wolpe & Lazarus (1968) have formally defined the principle of reciprocal inhibition:

> If a response inhibitory of anxiety can be made to occur in the presence of anxiety evoking stimuli it will weaken the bond between these stimuli and the anxiety (p. 12).

They have also stated that this principle can be used to overcome responses other than anxiety:

> For example, when assertive behavior is instigated, while the expression of "positive" feelings produces conditioned inhibitions of anxiety, the motor actions involved in such expression inhibit and consequently displace the previous motor habit (p. 13).

If some motor behaviors can inhibit other motor behaviors, it is conceivable that certain mental behaviors can do likewise. Thus, if the frequency of coverants antagonistic to overeating can be increased to the point of occurring repeatedly during the day (which implies in the presence of eating stimuli), then the bond between the stimulus to eat and the maladaptive eating response can be weakened if not broken.

Incompatibility as immediate punishment and reward. It is a well known axiom of learning theory that delayed reinforcement is not as effective as immediate reinforcement (Dollard & Miller, 1950; Reynolds, 1968). In fact, if what is thought to be a reinforcer is withheld for a sufficiently long enough time after the emission of a given response, no reinforcement of this particular activity will take place at all.

Perhaps the primary reason why maladaptive eating habits do not extinguish themselves is that the aversive consequences of overeating and the positive reinforcement for refraining from eating are both typically delayed for months or years. Negative coverants pertaining to obesity may be viewed as the aversive consequences (i.e. punishment) of overeating. Similarly, positive coverants related to the state of being properly proportioned may be seen as the reward for refraining from eating. If the probability of such coverants can be dramatically increased (by making an HPB contingent upon their occurrence), then vicarious experiences of punishment for overeating and reward for dieting will occur immediately and frequently each day. Consequently the individual should exhibit much more adaptive eating behavior.

Thus a number of psychological models might be invoked in order to explain the impact of coverant conditioning on the reduction of food intake. Each of those described, however, would not preclude the possibility of using eating behavior itself as an HPB. But Homme (1965) has argued that such a procedure would invite adaptation to the aversiveness of the coverants:

> S will typically report "this (thought) which seemed so horrifying to me at first, doesn't bother me anymore (p. 507)."

Therefore, Homme has maintained that a single neutral HPB should be selected from the literally hundreds that are available. Examples might be: combing one's hair, entering a particular room, or sitting down on a certain chair.

The application of coverant conditioning to the treatment of obesity requires a preparatory step, which in itself may be viewed as a simple weight loss program. The client must first become acquainted with what constitutes a maladaptive eating habit. He should also have a rough idea of the nutritional value of the foods in his diet (i.e. that a pie and coffee work-break may be the caloric equivalent of a steak and a large potato). This information could be condensed and made available to the client in booklet form. Many treatment programs stop after the mere cognitive exchange of such knowledge. For example, the client is presented with a diet plan and simply advised to follow it. The self-control of coverants would enable the client to "continue treatment," or better yet, would allow him to "manage his own treatment" between visits to the counselor.

It might be argued that any successful weight reduction program makes at least informal use of a coverant conditioning mechanism. Consider the woman who finds the thought of her doctor's disapproval to be highly aversive. Should she enter treatment for obesity, the dreaded image of "weighing in each week and not losing" occurring on a random basis would undoubtedly influence her daily eating habits. Homme's paradigm forces the systematic, repeated occurrence of many such anti-obesity coverants.

In addition to the problem of overeating, the coverant

conditioning technology can be used to increase the frequency of mental behaviors which are incompatible with cigarette smoking, stuttering, depression, possibly even alcoholism, drug addiction and a number of other self-defeating activities as well. Hark (1970), for example, concluded that in conjunction with the presence of a counselor, Homme's technique was an effective tool for helping motivated groups of clients extinguish their smoking behavior. And Davison (1969) noted that a similar procedure enabled a bright youth with inconsistent parents to adaptively control his rebellious behavior.

A variety of behavioral programs for the treatment of obesity have appeared in the literature. Operant and respondent techniques have been applied to both overt and covert behaviors with mixed success. But prior to this experiment, the effect on weight reduction of coverant conditioning through a self-management application of the Premack principle has not been systematically examined.

Other Behavioral Techniques in the Treatment of Obesity

Ferster and his associates (1962) described an operant conditioning procedure which was specifically designed to break several of the maladaptive eating habits already mentioned. Yet he provided no account of his program's effectiveness. Stunkard (1968, 1970), after personal communication with Ferster, reported that his results were essentially no better than those achieved by traditional methods.

Building on the work of Ferster, Stuart (1967) devised a number of step-by-step "behavioral prescriptions" for the treatment of

obesity. Both operant and respondent techniques were employed in Stuart's program which, he reported, enabled the clients to obtain self-control over their maladaptive eating habits. Eating rates, for example, were slowed down by instructing the clients to put small amounts of food in their mouths, and to place their utensils on the table until after swallowing. Dramatic weight lossess occurred in all eight clients. However, since no control groups were employed, the efficacy of individual treatment components (including that of extensive therapist contact) is not known.

Stuart also made use of an aversion therapy technique involving coverants. This process, called "covert sensitization," was originally described by Cautela (1966) as a treatment for compulsive behavior; it consisted of several specific procedures. After being told that the way to eliminate their eating compulsion was to associate the pleasurable object with an unpleasant stimulus, the subjects were trained in deep muscle relaxation. While relaxed they were asked to imagine themselves engaging in eating behavior. This scene was to be followed immediately by the imagination of an aversive event. Cautela had his client vicariously experience the sensation of vomiting. Stuart used an image of the client's husband seducing another woman. Both authors reported favorably for the technique in their case studies. However, in a controlled experiment Harris (1969) found that no additional weight loss could be attributed to covert sensitization.

Another aversion therapy technique employing covert behaviors was tested by Wolpe (1955). He reported the reduction of a food obsession in a woman by pairing electro-shock and fattening food

associations. But in a carefully controlled study, Stollak (1967) closely examined this procedure and noted insignificant effects.

Harris (1969) employed a multiplicity of behavioral techniques as part of an overall program designed to produce weight loss. Included was a form of coverant conditioning:

> ...among the suggestions were the reciting of the list of reasons for losing weight when tempted to overeat, the viewing of an unattractive picture of oneself in a bathing suit when tempted...(p. 265).

This procedure violates Homme's recommendation that eating behavior not serve as the HPB. Even so, Harris reported considerable success insofar as reducing the weight of her clients was concerned. But in view of the wide variety of factors involved, the relative efficacy (if any) of coverant conditioning was not established.

In conclusion, then, it should be noted that behavioral programs for the treatment of obesity have achieved sporadic success. No individual technique has, as yet, been validated. Coverant conditioning through a self-management application of the Premack principle appears to be a very promising procedure. But it too must be subjected to empirical test.

CHAPTER II: METHODOLOGY

Overview

Ninety-six female volunteers, mostly coeds between 20% and 30% overweight, were impartially assigned to one of four treatment groups. The first was a delayed treatment control; the second was a placebo or "typical" treatment control. In Groups 3 and 4 an attempt was made to increase the frequency of coverant pairs which individual subjects identified as being incompatible with their overeating habits. Negative coverants involved the undesirable aspects of being overweight (e.g. "a shortened life span"). Positive coverants involved the desirable aspects of being properly proportioned (e.g. "clothes fitting better").

Group 3 was exposed to a scheduled coverant treatment designed to determine the necessity of invoking the Premack principle by omitting it as a reinforcement methodology. These subjects were simply told to think of the negative-positive coverant pairs at least seven times a day. Group 4 received training in coverant conditioning through a self-management application of the Premack principle. These experimental subjects were helped in identifying a specific highly probable behavior (i.e. a non-eating activity occurring at least seven times a day, such as "sitting down on a particular chair"). They were then instructed to make the emission of this behavior contingent upon the thinking of a negative-

positive coverant pair.

All subjects were given the opportunity for a free physical exam prior to undergoing counseling. Those in Groups 2, 3, and 4 received a booklet containing information on obesity, a diet plan and three individual counseling sessions lasting ½ hour each (the second and third session followed the first by one and eight weeks respectively). Those in Group 1 were told that due to a large number of applicants and a limited staff, their scheduling would have to be delayed.

Properly proportioned graduate students in counseling conducted the treatment sessions. To facilitate coverant identification, a questionnaire was mailed to all clients in Groups 3 and 4 prior to their first counseling interview. Additional questionnaires were used to obtain frequency ratings for experiencing coverant pairs. Pre- and posttreatment weights were taken at the same time of day in street clothes minus shoes, on a physician's scale to the nearest quarter pound.

Sample

The experiment was conducted at Michigan State University in the Olin Memorial Health Center during the Spring of 1970. Participants in the study came from one of two sources: approximately two-thirds of the sample were respondents to announcements of a weight control counseling program in the University newspaper; the remaining third were direct referrals from Health Center physicians.

From an original subject pool of over 200 applicants, 96 females were selected who were roughly between 20% and 30% overweight. The

rationale for studying this weight range was developed, in part, by Stollak (1967, p. 61):

> ...all individuals more than 20% overweight are required to pay extra premiums on their life insurance policies (Keys, 1955), and over 30% overweight there is an increased probability of there being a physiological etiology and complication to the obesity (Olson, 1964).

Furthermore, subjects who were only a few pounds overweight could conceivably reach their goal weight, and then stop losing, long before the scheduled end of the eight week programs. Such an event would confound any meaningful comparison of average weight losses between groups. On the other hand, with subjects considerably more than 30% overweight, there exists a strong likelihood of concomitant emotional disturbance requiring more intensive counseling than was offered.

Males were excluded from the experiment because too few were available to allow for testing of the possible interaction between treatment and sex. (Both Stunkard, 1959b, and Harris, 1969 have suggested that males are more successful than females in losing weight.)

Table I provides an illustration of the selection range corresponding to the proper or goal weight of a given subject.

It should be noted that the screening procedure was, in fact, more crude than is immediately apparent. In the first place, the selection range was subject to the error of misplaced precision. While the quantities of 20% and 30% overweight can be exactly determined from an algebraic equation which includes the variable "proper weight," the difficulty in arriving at a precise estimate of this

TABLE I

Relationship Between Proper Weight And Selection Range

	Selection Range	
Proper Weight	20% Overweight	30% Overweight
100	120	130
105	126	136.5
110	132	143
115	138	148.5
120	144	156
125	150	162.5
130	156	169
135	162	175.5
140	168	182
145	174	188.5
150	180	195

latter concept is almost insurmountable. Mayer (1968) described some elaborate equipment and procedures which might have helped identify each subject's ideal weight, but such technology was financially beyond the scope of this experiment. Hence, the determination of the proper weight for each subject was roughly based on an interpolation of her self-estimated goal weight and a "guestimate" of this ideal weight made by physicians or trained personnel using standard charts and tables. In most instances, these two quantities were nearly identical.

A second factor which occasionally caused a slight stretching

of the 20% to 30% qualifying range arose from the delay between the time of the screening weight and the time of the pretreatment weight which was used in the final analysis. The interval here was generally less than a week; however, some borderline subjects gained or lost enough in this time period to place themselves slightly outside of the selection range.

The vast majority of participants in this study were unmarried, coed undergraduates, who had made many previous attempts at losing weight. Table II summarizes the personal and demographic data obtained from the application blanks.

Measures and Materials

The same physician's scale (with four ounce graduations) was used to measure the subjects' weights before and after treatment. In some instances another physician's scale and a portable scale were also employed. Both of these devices, however, were calibrated with the standard measuring instrument.

A number of questionnaires were distributed to the counseling groups at various times. These were:

1. An application blank requesting personal and demographic data was given to all groups. (See Appendix C.)

2. A pretreatment "fill in the blanks" handout designed to facilitate the identification of coverants was given to Groups 3 and 4. (See Appendix D.)

3. An extra page on Questionnaire 2, which attempted to ascertain the frequency of several personal, neutral, highly probable behaviors, was given to Group 4, (See Appendix E.)

4. A posttreatment questionnaire seeking coverant pair frequency ratings was given to Group 3. (See Appendix F.)

5. A posttreatment questionnaire requesting frequency ratings of joint coverant-HPB events was given to Group 4. (See Appendix G.)

TABLE II

Personal And Demographic Characteristics Of The Sample

Characteristic	Component Breakdown						Total N=96
Class Standing	Freshman	Sophomore	Junior	Senior	Graduate	Non-Student	Not Reported
	22	23	22	11	6	4	8
Family Income	< $5,000	$6,000 to $10,000	$11,000 to $15,000	$16,000 to $20,000	$21,000 to $25,000	> $25,000	Not Reported
	9	21	19	14	1	7	25
Ethnic Group	Caucasion	Negroid	Mongoloid	Spanish American	Other		Not Reported
	45	2	0	2	0		47
Religious Preference	Protestant	Catholic	Jewish	Agnostic-Athiest	None	Other	Not Reported
	40	22	6	1	14	3	10
Marital Status	Married	Single-Committed	Single-Not Committed				Not Reported
	10	48	36				2
Duration of Obesity	< 1 year	1 to 5 years	6 to 10 years	11 to 15 years	16 to 20 years	> 20 years	Not Reported
	14	33	16	2	21	3	7
Number of Previous Attempts at Losing Weight	None	One	Two	Three	Four	> Four	Not Reported
	7	17	14	7	2	40	9

A booklet entitled Sense and Nonsense About Obesity, written by the experimenter, was also distributed to Groups 2, 3, and 4 (and eventually to Group 1). It contained a behavioral explanation of the problem of obesity, an illustration of and self-quiz on the various maladaptive eating habits, some suggestions for a "weight loss action program," and a 1,000 calorie daily menu guide published by Eli Lilly and Company (1967), but based on earlier recommendations of the American Dietetic Association. (See Appendix H.)

Dittoed pages of paper divided into 10 rows and 2 columns headed "Negative Aspects" and "Positive Aspects," hereafter referred to as "scrap sheets," were used to help condense into pairs the relevant negative and positive coverants derived from the initial interview and Questionnaire 2. These were given to Groups 3 and 4. (See Appendix I.)

Credit card display cases consisting of 10 2½ inch by 4 inch plastic windows in a spiral-type wire binding were filled with index cards cut to size. Clients in Group 4 used these packets to carry the coverant pairs copied from the scrap sheet. (See Appendix J.)

Procedures

General Preliminaries

In order to obtain a sufficient number of volunteers, a letter requesting referrals was sent to all of the physicians on the staff at the Health Center, and announcements of a weight counseling program were placed in the University newspaper. (See Appendices A and B.) All subjects were provided with the opportunity for a free

medical evaluation prior to undergoing counseling in order to ascertain any organic complications. However, the cooperating physicians were asked to offer no weight counseling or diet medication to any of the participants in this study.

All of the subjects who were screened out of the experiment were treated separately. The 96 female volunteers who did qualify were impartially assigned to one of four individual counseling treatments. A slight deviation from strictly random procedures was necessitated because, in a few instances, roommates or close neighbors applied together. In order to prevent inter-treatment contamination arising from such subjects communicating with one another, their names were arranged in clusters, and the clusters were then randomly assigned to one of the counseling treatments.

Treatment Group Rationale

One noncounseled group and three counseled groups were employed. No differences existed in the allotted therapist contact time for any of the counseled clients. The progression of treatment groups from 1 to 4 differed only by the addition of a singular component. Group 1 received no treatment. Group 2 received only therapist attention (information and encouragement). Group 3 received therapist attention plus help in eliciting coverants. Group 4 received therapist attention, help in eliciting coverants, and training in a coverant reinforcement methodology. Any systematic differences between groups, then, must arise from the presence of or interaction between these principle components.

A comparison of the pre- and postweights of Group 1 subjects would provide a rough illustration of the role of motivation

producing systematic weight change. The major function of this delayed treatment control group, however, was to allow for an evaluation of the practical utility of the counseling treatments. Should a group of equally motivated noncounseled clients lose as much as their counseled counterparts, then the conclusion of counseling having no observable effects would be warranted.

The inclusion of Group 2 was essential in order to determine the therapeutic effect of coverant conditioning over and above possible systematic weight loss caused by therapist attention (Hawthorne effect). Generally speaking, the procedures in this placebo treatment were designed to approximate those of the classic approach to the treatment of obesity: a client or patient with a weight problem reports to an authority figure who dispenses information and encouragement while requiring a periodic check-up.

Group 3, the scheduled coverant treatment was employed in order to ascertain whether the Premack principle is really applicable in a self-management situation. It could have been argued:

> Telling a subject to make her highly probable behavior (HPB) contingent upon the emission of a pair of lowly probable coverants is no guarantee that she will do so. If a client is going to think of these negative-positive idea pairs at all, it is only because of the anticipated praise or punishment meted out by the counselor.

If this is true, then merely asking the clients to think of their coverants a given number of times per day is all that is necessary. No connection with an HPB need be employed. Hence in order to determine the necessity of invoking the Premack principle, Group 3 substituted this much simpler control reinforcement methodology.

The procedures in Group 4 were designed to be a practical

illustration of Homme's (1965) contention that clients who make the emission of a neutral HPB contingent upon the experience of covenants which are incompatible with obesity will modify their eating behavior and consequently lose weight.

Counselor Training

In order to reduce the possibility of experimenter bias inadvertently influencing the outcome of a particular treatment, six properly proportioned graduate students in addition to the experimenter conducted the counseling sessions. The case loads of each of the counselors are depicted in Table III.

TABLE III

Counselor Case Loads Within Each Treatment Group

Group 1, n=24	Group 2, n=24	Group 3, n=24	Group 4, n=24
Delayed Treatment	Placebo Treatment	Scheduled Treatment	Experimental Treatment
Not seen by any counselor	Counselor E, n=8	Counselor E, n=8	Counselor E, n=8
	Counselor A, n=8	Counselor B, n=8	Counselor C, n=8
	Counselor X, n=8	Counselor Y, n=8	Counselor Z, n=8

The experimenter, Counselor E, treated one-third of each of the counseled groups (and eventually all of Group 1). Counselors A, B, and C were male doctoral candidates. Each was randomly assigned to a block of one-third of the cases in Groups 2, 3, and 4. Counselors X, Y, and Z were female Master's degree students. Similarly each

was randomly assigned to a block of eight cases in either Group 2, 3, or 4.

All of the counselors were given a series of informal training sessions which included the following:

1. A dissemination of information on the problem of obesity (based on an elaboration of the booklet Sense and Nonsense About Obesity).

2. Practice in the operation and reading of the physician's scale.

3. Written instructions on (with a verbal explanation of):

   a. The general counseling format.
   b. The specific procedures to be employed in the counselor's individual group.

4. The opportunity to rehearse the particular mode of counseling expected of them.

Furthermore, each counselor was instructed to be as warm and supportive as possible in discussing with his clients the myriad personal problems related to being overweight. However, no "in depth" therapy was to be attempted. Clients expressing a need for such were to be referred to the University Counseling Center.

It should be noted that none of the clients were bluntly told that they were participating in an "experiment" of any kind. The subjects were given the impression that variations in weight counseling programs were "standard operating procedure" at the Health Center, as indeed they were. Finally, since none of the counselors could be considered "well read" in the problem of obesity, the experimenter was stationed in an adjacent office, available by telephone, and ready to answer any obscure question that might have arisen.

General Counseling Format

A series of three individual counseling sessions lasting one-half hour each was scheduled by telephone for each of the clients in Groups 2, 3, and 4. The second and third sessions followed the first by one and eight weeks respectively. Every appointment was confirmed by another call on the preceding day.

Pretreatment weights were taken at the beginning of the initial counseling interview; posttreatment weights were taken at the beginning of the final interview. Those in Group 1 were weighed upon application and then again prior to the first treatment session eight weeks later. Since all of the appointments of a given client were made at the same time of day, normal intra-day weight fluctuations were thus held constant. The weights of all clients were taken in street clothes, minus shoes, on a physician's scale to the nearest quarter-pound.

A significant number of subjects in each group were reluctant to return for the final weighing. Some were genuinely involved with studying for exams or extra-curricular activities; others offered similar excuses, but were actually embarrassed because of not having lost weight. It was therefore necessary to conduct the final interview with these clients in their residences, and to weigh them on a portable scale which was calibrated with the standard instrument.

Although each counseling treatment involved certain specific techniques, all counselors in Groups 2, 3, and 4 were instructed to adapt themselves to the following general format:

Session 1: In the first treatment session all of the counselors were told to cover seven points:

1. Introduction: Use your own words if you like. An example might be--"Hello, (S's name) ! My name is _____. I'm in the Counseling Department. I'm working with Dr. Mary Ryan and John Horan on the weight counseling program."

2. Weighing: Record the client's weight on the application blank to the nearest quarter-pound in street clothes minus shoes.

3. Reading period: Have the client sit on the bench beside the desk. Give her the booklet Sense and Nonsense About Obesity, and ask her to glance through it.

4. Self-analysis: Ask the client if the material in the booklet seemed to apply to her. In your own words, invite her to discuss any additional information about herself which she feels is relevant to her problem.

5. Directives: Explain the material presented in the booklet. Make sure she understands:

   a. how the diet plan works.
   b. the relationship between limited caloric intake and weight loss.
   c. the principles behind normal daily and monthly weight fluctuation.
   d. that on a diet of 1000 calories per day she can expect to achieve a true weight loss of between one and two pounds per week.

6. SPECIFIC PROCEDURES RELEVANT TO THE PARTICULAR GROUP TREATMENT WERE TO BE INTRODUCED AT THIS POINT.

7. Conclusion: Wish the client good luck. Tell her you'll see her in the same office, on the same day, at the same time next week.

Session 2: All of the counselors were instructed to open the second treatment session with an initial greeting and another weighing which would determine one of the following general counseling procedures:

1. Liberally praise subjects losing at least one pound. Respond to marked weight losses with enthusiasm mixed with cautions about trying to take off too much too soon.

   Clients losing in the neighborhood of five pounds will probably have experienced a menstrual cycle during the preceding week. So as not to arouse false hopes in the weeks to come, make sure these clients in particular are aware of the role of menstruation in precipitating dramatic weight loss.

Remind all clients that losses of one or two pounds per week should be considered ideal.

2. Discuss with those subjects who have not lost a pound (or have stayed the same or have gained slightly) their individual problems related to staying on a diet. Encourage them to keep trying.

   Oftentimes a true weight loss will be obscured by the monthly water build-up. Reassure clients who are expecting the onset of a menstrual period that they might experience a delayed reward for their previous dieting during the following week.

The second counseling interview also contained specific procedures relevant to the particular treatment group.

Session 3: Since posttreatment weights were determined at the beginning of the third counseling session, no weight loss can be attributed to the therapeutic procedures contained therein. However, the possible effect on weight reduction arising from the existence of this third contact being seen by the subjects as either a vague "threat" or certain "chance for additional praise" cannot be denied. As in the first and second interviews, the third counseling session contained specific procedures relevant to the particular treatment group, but the additional counseling content was to be adapted to the needs and wishes of each individual client. For example, some clients would be satisfied with their progress; others would seek more help and direction. Still others would decide not to continue trying to lose weight at that time.

Specific Treatment Techniques

Group 1: Delayed Treatment Control There were several specific procedures employed in the "treatment" of Group 1 clients. After filling out an application blank and having their weights verified,

these subjects were called or told that due to a large number of requests for help and a limited staff, their scheduling would have to be delayed for an unspecified amount of time. During the following weeks they were contacted again and given an appointment (eight weeks after their screening date) at which time their "post-treatment" weights were determined.

All clients in Group 1 were subsequently seen in a weekly group counseling situation and introduced to the experimental procedures of Group 4. The school year terminated, however, and many subjects returned to their outstate homes after only a few sessions, thus precluding the possibility of an "own control" comparison.

Group 2: Placebo or "Typical Treatment" Control The specific procedures employed in Group 2 were merely an extension of those in the general counseling format described above. In the first treatment session, Group 2 counselors were instructed to devote the extra time to "Self-analysis" and "Directives" (see points 4 and 5 on page 37). Similarly, in the second session, more time was available for "praising those who lost weight," or "encouraging those who hadn't." During the final interview, after posttreatment weights were determined, those clients requesting more help were introduced to the experimental procedure.

Group 3: Scheduled Coverant Treatment Control Prior to their initial counseling interview, all subjects in Group 3 received Questionnaire 2 in the mail. The main purpose of this questionnaire was to facilitate the identification of pertinent coverants.

In the first treatment session all Group 3 counselors were told to employ the following specific techniques which complimented the

general counseling format:

1. Introduction: same as in general format.

2. Weighing: same as in general format.

3. Reading period: As the client reads the information booklet, go through her questionnaire and write down the negative and positive coverants on the scrap sheet. Make a carbon copy.

4. Self-analysis: Clarify the coverants. If at least eight pairs have not been identified, interview for more.

5. Directives: same as in general format.

6. Present to your clients the following treatment rationale:

> "Being overweight is nothing more than the end result of the maladaptive habits you just read about.
>
> Now a reason why you haven't broken these habits is because both the punishment for overeating, namely getting fatter, and the reward for refraining from eating, namely getting thinner, are both delayed for a long period of time. (Give examples.)
>
> O.K., what we are going to do is try to make the punishment for overeating, and the reward for refraining from eating, occur immediately and frequently during the day.
>
> Here's what this means: (Show scrap sheet.) The punishments are the negative aspects related to being overweight; the rewards are the positive aspects of being properly proportioned. I've copied both from your questionnaire onto this list in a condensed form. Notice that the negative and positive thoughts have been put into pairs.
>
> Now our goal is to make these pairs occur often during the day.
>
> So force yourself to think of these pairs at least seven times per day. In this way, you'll make the punishment for overeating and the reward for dieting occur more frequently."

Give your client another explanation of the phenomenon:

> "Psychologists have another way of looking at this sort of thing. It's called 'reciprocal inhibition' which is a fancy way of saying you can't be tense and relaxed

at the same time. Neither can you be continually thinking of these thought pairs and keep on overeating."

Give your client the scrap sheet on which the coverants are written, while saving the carbon copy. On another sheet, ask the client to recopy them again later, in her own words and in her own handwriting. Blank spaces are for "secret" coverants she might feel embarrassed to talk about now, or "new" coverants she might think of during the weeks to come.

7. Conclusion: same as general model.

In the second treatment session all Group 3 counselors were instructed to employ the following specific procedures:

1. Ask your client how often during the past 24 hours she thought of a negative-positive coverant pair. Then inquire as to how frequently these thought pairs occurred during the preceding week on a per day average.

2. Encourage all clients to think of the coverant pairs at least seven times per day.

In the third treatment session the only specific procedure relevant to Group 3 was the administration of Questionnaire 4. The main purpose of this questionnaire was to establish frequency ratings of coverant pairs experienced during the preceding weeks.

Group 4: Experimental Treatment Prior to their initial counseling interview, all of the experimental subjects received Questionnaires 2 and 3 in the mail. These questionnaires were designed to help the counselor identify pertinent coverants and possible HPB's.

All Group 4 counselors were instructed to employ the following specific techniques in their first treatment session:

1. Introduction: same as in general format.

2. Weighing: same as in general format.

3. Reading period: As the client reads the information booklet, go through her questionnaires and write down the negative and positive coverants on the scrap sheet. Make a

carbon copy. Also tentatively identify a functional HPB, that is, a discreet activity, not related to eating, and occurring at least seven times per day.

4. Self-analysis: Clarify the coverants. If at least eight pairs have not been identified, interview for more. Establish the HPB.

5. Directives: same as in general format.

6. Present to your clients the following explanation of the coverant conditioning mechanism:

> "Being overweight is nothing more than the end result of the maladaptive habits you just read about.
>
> Now a reason why you haven't broken these habits is because both the punishment for overeating, namely getting fatter, and the reward for refraining from eating, namely getting thinner, are both delayed for a long period of time. (Give examples.)
>
> O.K., what we are going to do is make the punishment for overeating and the reward for refraining from eating occur immediately and frequently during the day.
>
> Here's how it works: (Show scrap sheet.) The punishments are the negative aspects related to being overweight; the rewards are the positive aspects of being properly proportioned. I've copied both from your questionnaire onto this list in a condensed form. Notice that the negative and positive thoughts have been put into pairs.
>
> Now our goal is to make these pairs occur often during the day.
>
> We can do this by picking one of the activities on your list and making the occurrences of this activity depend upon your thinking of a particular pair.
>
> In other words, before you allow yourself to engage in __(HPB)__, you must think of one of the pairs on this list. Think of a different pair each time you perform the __(HPB)__. Don't just read the words; let yourself get involved with the thoughts, both the negative and positive aspects.
>
> In this way we can make the punishment for overeating and the reward for refraining from eating occur frequently each day."

Give your client another explanation of the phenomenon:

> "Psychologists have another way of looking at this sort of thing. It's called 'reciprocal inhibition' which is a fancy way of saying you can't be tense and relaxed at the same time. Neither can you be continually thinking of these thought pairs and keep on overeating."

Cut the individual coverants out of the scrap sheet while saving the carbon copy. Insert them into the credit card display packet in an alternating negative-positive order. Ask the client to recopy them again later in her own words and in her own handwriting. Blank spaces are for "secret" coverants she might feel embarrassed to talk about, or "new" coverants she might think of during the weeks to come.

7. Conclusion: same as in general format.

In the second treatment session all Group 4 counselors were instructed to employ the following specific procedures:

1. Ask each client how often during the past 24 hours she experienced a joint coverant pair — HPB event. Then inquire as to how frequently these events occurred during the preceding week on a per day average.

2. Encourage all clients to think of the coverant pairs prior to the HPB and everytime they engage in the HPB, at least seven times per day.

3. Subjects having difficulty in "keeping the system going" may need a different HPB. Find out if this is so and act accordingly.

In the third treatment session the only specific procedure relevant to Group 4 was to administer Questionnaire 5. The main purpose of this questionnaire was to establish frequency ratings of joint coverant-HPB events during the preceding weeks.

Hypotheses

Research or alternate hypotheses will be designated with the letters "H_A" numbered 1 through 7. All seven null hypotheses will be formally stated in Chapter III and the symbol "H_0" will be used to identify them. The general expectation of this study was that

counseled clients who receive training in coverant conditioning (Group 4) would exhibit greater weight losses at the end of an eight week period than would counseled and noncounseled clients who do not receive such training (Groups 1, 2, and 3). Such a prediction implied the examination of three distinct hypotheses:

1. H_{A1}: $\mu_4 < \mu_1$

   After adjustment for initial differences, the posttreatment weight of Group 4 will be lower than the posttreatment weight of Group 1.

2. H_{A2}: $\mu_4 < \mu_2$

   After adjustment for initial differences, the posttreatment weight of Group 4 will be lower than the posttreatment weight of Group 2.

3. H_{A3}: $\mu_4 < \mu_3$

   After adjustment for initial differences, the posttreatment weight of Group 4 will be lower than the posttreatment weight of Group 3.

It was also expected that because of the Hawthorne effect the counseled control groups would exhibit greater weight losses at the end of an eight week period than would the noncounseled control group. Specifically, this implied the examination of two additional hypotheses:

4. H_{A4}: $\mu_3 < \mu_1$

   After adjustment for initial differences, the posttreatment weight of Group 3 will be lower than the posttreatment weight of Group 1.

5. H_{A5}: $\mu_2 < \mu_1$

   After adjustment for initial differences, the posttreatment weight of Group 2 will be lower than the posttreatment weight of Group 1.

Furthermore, a basic assumption of the coverant conditioning treatment program is that the frequency of experiencing coverants is

inversely related to weight differential. The more a client elicits coverants incompatible with overeating, the greater will be her weight reduction. Such a relationship was expected to emerge in Groups 3 and 4.

6. H_{A6}: $\rho_{xy} < 0$

   The frequency of experiencing coverant pairs will be inversely related to weight differential.

Finally, if Premack's principle is really applicable in a self-management situation, then clients who attempt to reinforce their coverants through the use of this principle (Group 4), will elicit more coverants than will clients who attempt to follow a predetermined coverant frequency schedule (Group 3).

7. H_{A7}: $\mu_4 > \mu_3$

   The frequency of experiencing coverant pairs in Group 4 will exceed the frequency of experiencing coverant pairs in Group 3.

Experimental Design

This investigation used an elaboration of the "pretest-posttest control group design" described by Campbell and Stanley (1967). Figure 1 provides a pictorial representation. The pretest (initial weight) was essential because slight deviations from strictly random assignment precluded any assumption of pretreatment equivalence between groups.

Statistical Analysis

Hypotheses 1, 2, 3, 4, and 5. In order to investigate possible treatment effects an initial decision had to be made between the analysis of variance (ANOVA) and the analysis of covariance (ANCOVA)

I = Impartial assignment
O_1 = Weight at first appointment (pretest)
O_2 = Weight at second appointment (posttest)
The time interval between O_1 and O_2 was 8 weeks.
(X) = Control treatment
X = Experimental treatment

$$I \begin{cases} O_1 \quad (X)_1 \quad O_2 & \text{Delayed Treatment Control Group} \\ O_1 \quad (X)_2 \quad O_2 & \text{Placebo Treatment Control Group} \\ O_1 \quad (X)_3 \quad O_2 & \text{Scheduled Coverant Treatment Control Group} \\ O_1 \quad X \quad O_2 & \text{Experimental Treatment Group} \end{cases}$$

Figure 1. Pictorial representation of the experimental design

statistical models. By inspection of the coefficient of determination, sometimes referred to as the square of the multiple r (see Table IV), it was observed that the pretest when used as a covariate accounted for 90% of the variance of the dependent variable. Hence, the ANCOVA was deemed proper.

TABLE IV

Statistics For Regression Analysis With 1 Covariate

Variable	Square of Multiple r	Multiple r	F	p level
Posttest	0.9037	.9506	703.5996	0.00001
		df for Hypothesis	1	
		df for Error	75	

Upon emergence of a significant omnibus F, the Scheffé post hoc technique was employed in order to ascertain which treatment groups differed from each other. The Scheffé method was chosen because it

allowed freedom in picking the contrasts while not sacrificing the overall alpha level of .05.

Hypothesis 6. The relationship between coverant frequency and weight differential in Groups 3 and 4 was expressed in terms of a Pearson r. The significance of this correlation was determined from standard tables (Hays, 1963).

Hypothesis 7. Differences in the number of coverants elicited by Groups 3 and 4 were plotted on a weekly basis for visual inspection. The significance of the expected overall discrepancy was determined by a t test.

CHAPTER III: RESULTS

Treatment Effects

The effect of the four counseling procedures on weight reduction can be seen in Tables V and VI. Average weights (before and after treatment) and average weight losses of each group are presented in Table V. All individual subject scores are presented in Table VI should a closer inspection of the data be sought.

TABLE V

Mean Pre And Post Weights, And
Weight Losses For Groups 1, 2, 3, And 4

Counseling Group	Mean Pre Weight	Mean Post Weight	Mean Weight Loss
G1: Delayed Treatment	153.80	153.82	+0.02
G2: Placebo Treatment	148.98	145.85	-3.13
G3: Scheduled Treatment	143.26	140.54	-2.72
G4: Experimental Treatment	156.07	150.41	-5.66

No consensus exists in the literature as to the most appropriate method of program evaluation. Success, for example, might be defined in terms of the number of participants losing at least one pound per week. In Group 4, 53% of the subjects met such a criterion. This figure compares quite favorably to the 21% in Group 3, the 20% in Group 2, and the 5% in Group 1, who could be considered successful weight losers.

TABLE VI

Pre And Post Weights, And Weight Losses Of Subjects In Groups 1, 2, 3, And 4

	Group 1			Group 2			Group 3			Group 4		
Subject	Pre	Post	Loss	Pre	Post	Loss	Pre	Post	Loss	Pre	Post	Loss
A	149.50	149.00	- .50	127.00	121.75	- 5.25	149.00	145.50	- 3.50	137.00	129.00	- 8.00
B	131.25	130.00	- 1.25	134.00	132.25	- 1.75	134.25	122.75	-11.75	157.00	146.50	-10.50
C	146.50	147.75	+ 1.25	163.50	166.00	+ 2.50	168.00	164.00	- 4.00	142.25	124.75	-17.50
D	133.25	139.00	+ 5.75	155.00	146.50	- 8.50	116.25	118.50	+ 2.50	123.00	114.50	- 8.50
E	131.00	134.00	+ 3.00	157.25	154.50	- 2.75	122.75	122.00	- .75	163.75	148.25	-15.50
F	141.00	145.25	+ 4.25	121.00	114.00	- 7.00	122.50	125.50	+ 3.00	168.25	161.25	- 7.00
G	145.75	142.25	- 3.50	161.25	148.25	-13.00	130.00	129.50	- .50	146.25	142.50	- 3.75
H	146.75	147.00	+ .25	147.25	148.25	+ 1.50	139.00	137.50	- 1.50	174.75	174.50	- .25
I	172.50	158.25	-14.25	134.50	133.50	- 1.00	121.75	119.50	- 2.25	174.50	163.00	-11.50
J	156.50	155.25	- 1.25	121.00	126.50	+ 5.50	126.00	123.50	- 2.50	179.75	160.50	-19.25
K	153.00	151.50	- 1.50	133.50	137.00	+ 3.50	159.00	150.50	- 8.50	162.50	151.25	-11.50
L	136.25	134.50	- 1.75	128.50	126.50	- 2.00	134.75	125.75	- 9.00	145.00	144.00	- 1.00
M	148.25	145.75	- 2.50	151.00	148.50	- 2.50	140.50	135.00	- 5.50	127.00	135.50	+ 8.50
N	152.25	153.50	+ 1.25	141.25	144.50	+ 3.25	174.25	164.25	-10.00	146.75	136.50	-10.25
O	167.50	163.75	- 3.75	164.25	151.50	-12.75	140.25	144.50	+ 4.25	137.50	145.50	+ 8.00
P	169.50	170.00	+ .50	138.25	128.50	- 9.75	133.00	135.50	+ 2.50	179.75	185.00	+ .25
Q	151.50	153.00	+ 1.50	176.00	176.50	+ .50	171.25	169.50	- 1.75	168.25	174.75	+ 6.25
R	165.00	178.00	+13.00	178.00	170.50	- 7.50	198.25	194.50	- 3.75	187.50	179.00	- 8.50
S	144.25	144.75	+ .50	183.00	181.50	- 1.50	141.25	142.50	+ 1.25	144.50	141.50	- 3.00
T	167.00	164.25	- 2.75	164.00	160.50	- 3.50						
U	195.50	194.00	- 1.50									
V	179.50	183.25	+ 3.75									

In this experiment, however, differences between group scores, expressed in pounds, were tested by means of an analysis of covariance (ANCOVA), using pretreatment weight as the covariate. Individual treatment comparisons and tests of specific hypotheses were contingent upon the emergence of a significant ($p < .05$) omnibus F. The results of the ANCOVA are depicted in Table VII.

TABLE VII

Summary Of The Univariate Analysis Of Covariance

Mean Square Between	F	p level
109.3609	3.2332*	$p < .0270$
	df: 3, 75	

* significant beyond the .05 level

The omnibus F was significant beyond the .05 level, thus indicating that differences did exist between the effects of the counseling procedures. Specifically, this implied rejection of the following null hypothesis:

General H_0: $\mu_1 = \mu_2 = \mu_3 = \mu_4$

After adjustment for initial differences, the posttreatment weights of Groups 1, 2, 3, and 4 will not differ from each other.

And permitted acceptance of one or more inequality in the following alternate hypothesis:

General H_A: $\mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4$

After adjustment for initial differences, the posttreatment weights of Groups 1, 2, 3, and 4 will not be equal.

The Scheffé post hoc comparison technique was then employed in order to ascertain which treatment groups differed from each other. The results of this investigation are presented in Table VIII.

TABLE VIII

All Pairwise Post Hoc Comparisons

Comparison	Least Square Estimates (adjusted for covariate)	Standard Errors of Least Square Estimates	Significant $p < .05$
G4 vs. G1 * Experimental vs. Delayed	-5.516305	1.823181	yes
G4 vs. G2 * Experimental vs. Placebo	-2.019695	1.879607	no
G4 vs. G3 * Experimental vs. Scheduled	-2.007613	1.939303	no
G3 vs. G1 * Scheduled vs. Delayed	-3.508692	1.858319	no
G3 vs. G2 Scheduled vs. Placebo	-0.012082	1.873854	no
G2 vs. G1 * Placebo vs. Delayed	-3.496610	1.804741	no

* Tests of specific hypotheses

From Table VIII it can be inferred that Group 4 lost more weight than Group 1; all other pairwise comparisons were not significant. The first five hypotheses of this study focused on possible differences between the effects of the counseling procedures:

Hypothesis 1:

H_{01}: $\mu_4 \geq \mu_1$

After adjustment for initial differences, the posttreatment weight of Group 4 will equal (or be greater than) the posttreatment weight of Group 1.

H_{01} rejected in favor of H_{A1}.

H_{A1}: $\mu_4 < \mu_1$

After adjustment for initial differences, the posttreatment weight of Group 4 will be lower than the posttreatment weight of Group 1.

H_{A1} confirmed.

Hypothesis 2:

H_{02}: $\mu_4 \geq \mu_2$

After adjustment for initial differences, the posttreatment weight of Group 4 will equal (or be greater than) the posttreatment weight of Group 2.

H_{02} failed to be rejected.

Hypothesis 3:

H_{03}: $\mu_4 \geq \mu_3$

After adjustment for initial differences, the posttreatment weight of Group 4 will equal (or be greater than) the posttreatment weight of Group 3.

H_{03} failed to be rejected.

Hypothesis 4:

H_{04}: $\mu_3 \geq \mu_1$

After adjustment for initial differences, the posttreatment weight of Group 3 will equal (or be greater than) the posttreatment weight of Group 1.

H_{04} failed to be rejected.

Hypothesis 5:

H_{05}: $\mu_2 \geq \mu_1$

After adjustment for initial differences, the posttreatment weight of Group 2 will equal (or be greater than) the posttreatment weight of Group 1.

H_{05} failed to be rejected.

Counselor Effects

Three male doctoral candidates (Counselors A, B, and C), and three female Master's degree students (Counselors X, Y, and Z), in addition to the experimenter (Counselor E), conducted the treatment sessions. Counselor-treatment assignments were designed to reduce the possibility of experimenter bias inadvertently influencing the outcome of a particular treatment. Such a bias or vested interest ("Rosenthal effect") could be manifested by conspicuously high or low weight losses in clients counseled by E. Table IX presents the mean weight loss scores of each counselor's case load.

TABLE IX

Mean Weight Loss Achieved By Subjects Classified According To Counselor And Treatment Group

Group 2 Placebo Treatment	Group 3 Scheduled Treatment	Group 4 Experimental Treatment
Counselor E -4.28 n=8	Counselor E -3.50 n=5	Counselor E -8.12 n=8
Counselor A +1.13 n=6	Counselor B -3.34 n=8	Counselor C -5.29 n=7
Counselor X -5.75 n=6	Counselor Y -1.08 n=6	Counselor Z -1.25 n=4

Within each treatment group certain counselors seemed to differ from each other insofar as effecting weight loss among their clients was concerned. Such differences, however, should be interpreted with extreme caution; the original n of 8 scores per cell was reduced even more by subject mortality, thus precluding the possibility of statistical test. Generally speaking, E achieved better than average success in the control and the experimental treatments. Hence, inordinant experimenter bias was not demonstrated.

Coverant Frequency and Weight Reduction

As a result of counseling, the subjects in Groups 3 and 4 reported that they experienced coverant pairs on a daily basis. The frequency of these mental behaviors differed from group to group and from client to client. It was expected that the number of coverants elicited each day would be inversely related to weight differential. Thus, if such coverants were really incompatible with overeating, then clients who experienced the greatest number of coverant pairs would lose the most weight. A Pearson r of -.27 was found to exist between the two variables. Although the relationship was in the expected direction, it was not sifnificant.

Hypothesis 6:

H_{06}: $\rho_{xy} \geq 0$

The frequency of experiencing coverant pairs will not be related (or be directly related) to weight differential.

H_{06} failed to be rejected.

Effect of the Premack Principle on Coverant Frequency

All subjects in Group 3 were simply told to think of the negative and positive coverant pairs at least seven times each day for

the duration of the treatment program. The subjects in Group 4 were instructed to make the occurrence of a neutral highly probable behavior (HPB) contingent upon thinking of one of the coverant pairs on their lists. (One of the criteria for HPB selection had been that the particular activity occurred at least seven times per day.) Figure 2 depicts the daily coverant pair frequencies reported by Groups 3 and 4.

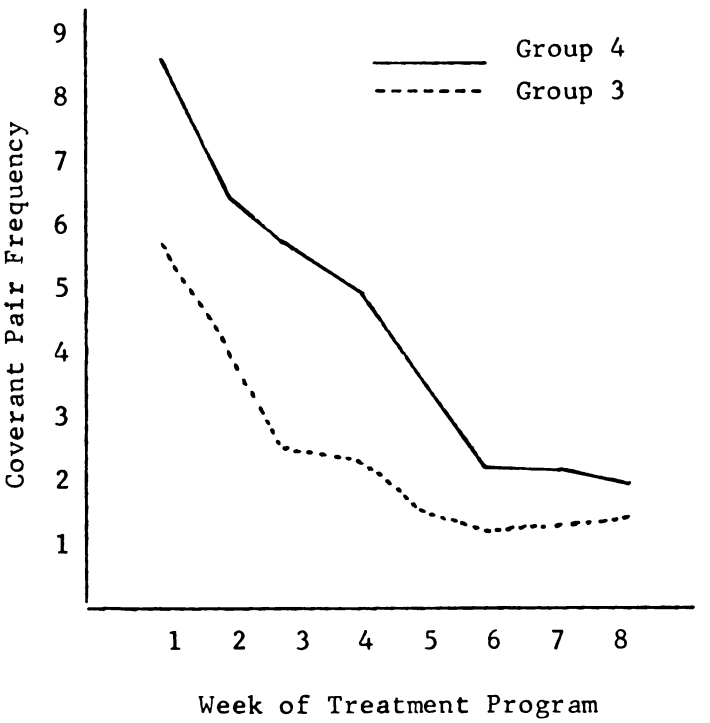

Figure 2. Daily coverant frequencies for Groups 3 and 4.

Both groups exhibited rapidly declining coverant pair frequency rates throughout the course of treatment. However, Group 4 experienced significantly more coverants than did Group 3 ($t_{36}.05=-2.013$). The last hypothesis predicted this difference.

Hypothesis 7:

H_{07}: $\mu_4 \leq \mu_3$

The frequency of experiencing coverant pairs in Group 4 will equal (or be less than) the frequency of experiencing coverant pairs in Group 3.

H_{07} rejected in favor of H_{A7}.

H_{A7}: $\mu_4 > \mu_3$

The frequency of experiencing coverant pairs in Group 4 will exceed the frequency of experiencing coverant pairs in Group 3.

H_{A7} confirmed.

Subject Mortality

Of the 96 participants in this study, 16.6% terminated prematurely. Seven dropped out prior to beginning treatment (i.e. were "no show" at their first and subsequent appointments); nine did not continue after coming to the first or second counseling session. A complete breakdown of subject mortality is presented in Table X.

TABLE X

Subject Mortality Within Treatment Groups

Counseling Group	Original n	Premature Terminators			Final n
		Prior to Treatment	During Treatment	Total	
G1: Delayed	24	2	-	2	22
G2: Placebo	24	1	3	4	20
G3: Scheduled	24	1	4	5	19
G4: Experimental	24	3	2	5	19

In Group 1 two subjects did not report for the final weighing. One had quit school and had moved out of the area; the other stated

that she was no longer interested in losing weight.

In Group 2 one subject did not report for the initial interview. After several attempts to reschedule her it became apparent that she did not wish to begin treatment. Three other subjects did not return for the final weighing. One of these had left school early; the remaining two could not be reached for comment.

After receiving Questionnaire 2, one subject in Group 3 decided not to begin treatment. Four other subjects did not report for the final weighing. One of these had been hospitalized because of personal problems. Another refused to continue treatment because she felt that the counseling procedure was "humiliating." (The counselor recalled that this particular client had insisted that her's was a height, not a weight problem.) The remaining two made themselves unavailable for comment; "evasion" ploys suggested they did not lose weight.

After receiving Questionnaires 2 and 3, three subjects in Group 4 decided not to begin treatment. Two other subjects did not return for the final weighing. One of these maintained that counseling was of no benefit to her as her weight problem was not related to food intake, but rather to physiological malfunctioning. The other subject had left the area prior to the time of her final appointment.

Status of Research Hypotheses

H_{A1}: After adjustment for initial differences, the posttreatment weight of Group 4 will be lower than the posttreatment weight of Group 1. Confirmed.

H_{A2}: After adjustment for initial differences, the posttreatment weight of Group 4 will be lower than the posttreatment weight of Group 2. Not Confirmed.

H_{A3}: After adjustment for initial differences, the posttreatment weight of Group 4 will be lower than the posttreatment weight of Group 3. Not Confirmed.

H_{A4}: After adjustment for initial differences, the posttreatment weight of Group 3 will be lower than the posttreatment weight of Group 1. Not Confirmed.

H_{A5}: After adjustment for initial differences, the posttreatment weight of Group 2 will be lower than the posttreatment weight of Group 1. Not Confirmed.

H_{A6}: The frequency of experiencing coverant pairs will be inversely related to weight differential. Not Confirmed.

H_{A7}: The frequency of experiencing coverant pairs in Group 4 will exceed the frequency of experiencing coverant pairs in Group 3. Confirmed.

CHAPTER IV: DISCUSSION

Conclusions

Apparently, motivation alone (defined as willingness to volunteer for treatment), was not responsible for systematic weight loss. In fact, the subjects in Group 1 who volunteered but received no counseling, showed a slight gain of +0.02 pounds at the end of an eight-week period. On the other hand, comparable subjects in Group 4 who received instruction in coverant conditioning through a self-management application of the Premack principle exhibited a substantial weight loss of -5.66 pounds. The difference between these groups was statistically significant ($p < .03$). But perhaps even more important, over half of the experimental subjects exceeded the practical ideal of losing at least a pound per week.

Group 2, the placebo or typical treatment control, showed a moderate weight reduction of -3.13 pounds. However, in comparison with Group 1, this loss was not statistically significant. Hence, the difference between these groups cannot properly be attributed to anything other than random error. It may very well be, though, that the Hawthorne effect, along with possible effects of the "typical treatment" content, contributed to the lower scores of Group 2 subjects. Each of the counselors in this group displayed a warm and supportive interest in their clients' weight problems, and the counseling technique itself was quite credible.

A similar interpretation can be made for the outcome of Group 3. The average weight loss of the scheduled coverant treatment control was only about 6.6 ounces lower than that of Group 2. Thus, although the posttreatment means of Groups 1, 2, and 3 varied in the expected direction, differences between these groups were not statistically significant. In this experiment, then, the control counseling procedures were not proven to be better than no counseling at all. This finding mirrors the "real world," wherein commonly employed procedures (represented by Group 2) and occasional innovations (such as Group 3) rarely achieve success.

The experimental subjects in Group 4 lost more weight than any of the control groups; however, differences between Groups 4 and 3, and Groups 4 and 2 were not statistically significant. Such gave rise to the following paradox:

$$\mu_1 = \mu_2 = \mu_3$$
$$\mu_2 = \mu_3 = \mu_4$$
$$\mu_4 \neq \mu_1$$

μ = Mean posttreatment weight of a given group after adjustment for initial differences

Resolution of this seeming contradiction can be found in the logic of hypothesis testing. Groups 2 and 3 were not proved equal to Group 1, nor were they proved equal to Group 4. Differences between Groups 2 and 3 vs. Group 1, and Groups 2 and 3 vs. Group 4 were in the expected direction; however, they were not of sufficient magnitude to permit rejection of equality. This combination of insignificant differences ("just misses") enabled a statement of inequality between Groups 4 and 1 to be made with a high degree of confidence.

In retrospect, extensive similarity between the experimental counseling treatment (Group 4) and the control counseling treatments

(Groups 2 and 3) probably accounts for the failure to obtain significant differences between the effects of these counseling techniques. Certain control procedures (planned similarities) were, of course, necessary in order to evaluate the effectiveness of coverant conditioning as a therapeutic adjunct. Not anticipated, however, was the extent to which the control subjects in Group 2 adopted the principles of coverant conditioning on an informal basis. Several successful weight losers in this group spontaneously reported using such motivational aids as "I just kept thinking about how nice I could look on my wedding day" or "My roommate and I posted a picture of a fabulously skinny girl on the refrigerator door." Also unexpected was the finding that the coverant frequency pattern experienced by Group 3 was comparable to that experienced by Group 4 (see Figure 2 on page 55).

In spite of this high degree of similarity, the experimental group was the only one of four which lost a significant amount of weight. The probable conclusion, then, is that this loss can be attributed to the fact that Group 4 experienced a high frequency of coverants which were incompatible with overeating.

On the other hand, it might be argued that coverant conditioning was only indirectly effective:

> The experimental subjects worked harder at losing weight because they found their treatment to be much more intellectually appealing than did the subjects in either of the control procedures. Anything new works for a while, but as the novelty wears off, so does the therapeutic effect.

If so, then future research will bear this out. Presently, as an alternate explanation such a position is, at best, tenuous.

In Groups 3 and 4 the measured relationship between coverant frequency and weight differential was in the expected direction. Generally speaking, the clients who experienced the greatest number of coverant pairs lost the most weight. However, the Pearson r of -.27 between these two variables was much too slight (not significant at the .05 level) to draw strong conclusions about the theoretical incompatibility of certain coverants with motor behavior.

Perhaps the primary reason for a strong relationship not emerging is the probable lack of validity in the questionnaires used to obtain coverant pair frequency ratings. In the first place these tabulations were based entirely upon verbal report, as no method exists for counting the private mental experiences of a particular subject without his consent.

Failure to lose weight is accompanied by strong disappointment. For a variety of personal reasons, obvious instances of inaccurate reporting did take place. One subject in Group 4, for example, who had gained eight pounds, indicated that she "stopped trying to lose weight" about two weeks after her initial interview. A month long illness, as the story went, caused her to be put on medication with water-retention side effects. Yet on Questionnaire 5 she claimed a very high number of deliberate coverant-HPB experiences throughout the eight-week period. (This inconsistency was not pointed out to her; doing so would probably have increased her already high anxiety level and precipitated another prevarication.)

Subject dishonesty, however, can work for the hypothesis as well as against it. A few successful reducers may have attributed their losses to inflated estimates of coverant experiences.

But apart from client honesty, the validity of Questionnaires 4 and 5 was also reduced by the difficult nature of the requested task. At the beginning of the second counseling session, the subjects were asked how often (on a per day average) they thought of the coverant pairs (Group 3) or made an HPB contingent upon the thinking of a coverant pair (Group 4). Responding to this inquiry was relatively simple. However, the same request was made at the end of the treatment program to cover the intervening seven weeks. Unfortunately, most clients were capable of giving only approximate tallies. This weakness was anticipated, but tolerated, because "in between monitoring" would probably have altered the nature of the self-management concept. Therefore, it appears that inaccurate reporting of coverant experiences, (both intentional and uncontrollable) may have seriously affected questionnaire validity, and consequently obscured the real relationship between frequency coverant elicitation and weight differential.

Although Group 4 experienced significantly more coverant pairs than Group 3 ($p < .05$), both groups exhibited rapidly declining rates. The major differences occurred within the first few weeks of treatment. Hence, the sustained self-management applicability of the Premack principle was not demonstrated.

In conclusion, then, coverant conditioning appears to be a viable therapeutic adjunct for the treatment of obesity, probably because the experience of "incompatible" coverants is inversely related to weight differential. However, the applicability of the Premack principle in a self-management situation has not been established.

Limitations and Implications

In view of the recidivism of the obesity problem (those who are successful at losing weight often regain it), a major criticism of this study might be that no long range follow-up was conducted. Such a possibility, however, was precluded by the transient nature of the student population from which the bulk of the sample was drawn.

Furthermore, as stated in Chapter I, the major concern of this experiment was to determine the therapeutic effect of a particular type of coverant conditioning which seemed to have strong implications for the treatment of a number of personal problems in addition to obesity. This was to be an exploratory study, hence the task of developing a comprehensive and marketable method of weight reduction was simply not undertaken.

Finally, very few members of the helping professions have had any success whatever in their attempts to effect a weight loss, much less prevent their clients from regaining. Perhaps two distinct research problems are involved here.

Another limitation of this study was anticipated by Kiesler in his succinct description of the "patient uniformity assumption." This "myth" implies that clients "at the start of treatment are more alike than they are different," and will consequently respond to a given type of therapy in a similar manner. On the contrary, overweight people are probably more different than they are alike. To assume that all will react identically to a counseling procedure involving coverant conditioning would be erroneous.

The relatively low mortality rate of this study obscures the fact that the experimental treatment was not equally effective with

all clients. In fact, three Group 4 subjects showed conspicuous weight gain. Several other subjects who did not lose weight were reluctant to return; it was therefore necessary to conduct the final interview and weighing in their residence. These "therapeutic failures" naturally lowered the average weight loss of the experimental group. But the personal and social variables which might have helped identify potentially successful clients were, and remain, unknown.

Since the coverant conditioning "ritual" resembles an obsessive neurosis (however artificial), one might speculate that compulsive personality types would be quite amenable to this form of treatment. Future research might also consider the demographic variable of "forced diet" and its relationship to treatment effectiveness. Many of the subjects in this experiment lived in dormitories and could not plan their own meals. It may well be that a substantial fraction of the clients who did not lose weight (in all groups) were those who had few, if any, food choice options.

Keeping Kiesler's concepts in mind, Hark (1970) divided his sample of cigarette smokers on the basis of the Meyers-Briggs personality types. But none of these categories were differentially more responsive to the coverant conditioning treatment. Theoretical poverty in this area is still the "status quo."

Further research is also needed to determine whether the Premack principle is really applicable in a self-management situation. Its role in this experiment was not clear. On one hand, only those subjects who received such training lost a significant amount of weight. But on the other hand, practically speaking, the average

number of additional coverant pair experiences attributable to this instruction was relatively small.

Perhaps the answer to this puzzle lies in an unanticipated inconsistency between Questionnaires 4 and 5. The subjects in Group 3 were asked how often they thought of the coverant pairs; those in Group 4 were asked how frequently they made an HPB contingent upon these mental behaviors. It is quite probable that Group 4 clients experienced many additional coverants which were not connected to a highly probable activity. If so, then these uncounted, random, incompatible thoughts might be responsible for a substantial fraction of the total weight loss.

Researchers in this area might seriously consider increasing the number of therapist-client contact hours. Many subjects in this study expressed the desire for more counseling sessions (i.e. between the second and final interviews). But to allow such at first seemed to rub against the grain of the self-management idea. Then again, maybe clients would elicit more coverant-HPB events, if they knew beforehand that they would be quizzed about the frequency of these experiences at the end of each week. There is nothing sacred about retaining the concept of self-management; finding ways to improve the treatment is a much more noteworthy endeavor.

Homme's (1965) opinion that only non-eating HPB's should be employed is another researchable question. One client noted that the highly probable entry into her bedroom became less probable when it was made contingent upon the thinking of lowly probable coverants. If eating were used as an HPB in this case, then simple mechanics would have solved part of her obesity problem.

The nature of the incompatible coverant effect also needs clarification. Perhaps if some reliable scale could be devised which would measure "intensity of experience" it might be shown that the notion of incompatibility is really a function of both coverant frequency and intensity. If such is true then the weak correlation of -.27 between coverant frequency alone and weight differential (obtained in this study) is certainly understandable.

Finally, this experiment employed combinations of negative and positive coverants. It is not known whether these pair components are differentially effective.

Essentially, then, coverant conditioning appears to be a promising therapeutic technique. Further research may clarify its impact and increase its effectiveness in the treatment of obesity and other personal problems.

Summary

The purpose of this study was to determine the effect on weight reduction of coverant conditioning through a self-management application of the Premack principle. Coverants (a contraction of "covert operants" coined by Homme) are mental behaviors such as thoughts, images, feelings, reflections and so forth. An adaptation of the Premack principle--"For any pair of responses the more probable one will reinforce the less probable one"--provided a methodology through which certain coverants were reinforced.

It was hypothesized that counseled clients who received training in a particular type of coverant conditioning would exhibit greater weight loss at the end of an eight-week period than would counseled

and noncounseled clients who did not receive such training.

Ninety-six female volunteers, mostly coeds between 20% and 30% overweight, were impartially assigned to one of four treatment groups. The first was a delayed treatment control; the second was a placebo or "typical" treatment control. In Groups 3 and 4 an attempt was made to increase the frequency of coverant pairs which individual subjects identified as being incompatible with their overeating habits. Negative coverants involved the undesirable aspects of being overweight (e.g. "a shortened life span"). Positive coverants involved the desirable aspects of being properly proportioned (e.g. "clothes fitting better").

Group 3 was exposed to a scheduled coverant treatment designed to determine the necessity of invoking the Premack principle by omitting it as a reinforcement methodology. These subjects were simply told to think of the negative-positive coverant pairs at least seven times a day. Group 4 received training in coverant conditioning through a self-management application of the Premack principle. These experimental subjects were helped in identifying a specific highly probable behavior (i.e. a non-eating activity occurring at least seven times a day, such as "sitting down on a particular chair"). They were then instructed to make the emission of this behavior contingent upon the thinking of a negative-positive coverant pair.

All subjects were given the opportunity for a free physical exam prior to undergoing counseling. Those in Groups 2, 3, and 4 received a booklet containing information on obesity, a diet plan, and three individual counseling sessions lasting ½ hour each (the

second and third session followed the first by one and eight weeks respectively). Those in Group 1 were told that due to a large number of applicants and a limited staff, their scheduling would have to be delayed.

Properly proportioned graduate students in counseling conducted the treatment sessions. To facilitate coverant identification, a questionnaire was mailed to all clients in Groups 3 and 4 prior to their first counseling interview. Additional questionnaires were used to obtain frequency ratings for experiencing coverant pairs. Pre- and posttreatment weights were taken at the same time of day in street clothes minus shoes, on a physician's scale to the nearest quarter-pound.

After eight weeks the mean weight losses for Group 1 (Delayed Treatment), Group 2 (Placebo Treatment), Group 3 (Scheduled Coverant Treatment), and Group 4 (Reinforced Coverant Treatment) were +0.02, -3.13, -2.72, and -5.66 pounds respectively. Using an analysis of covariance design with pretreatment weight as the covariate, Group 4 lost significantly more weight than did Group 1 ($p < .03$). All other pairwise comparisons were not significant.

In Groups 3 and 4 the frequency of experiencing coverant pairs was inversely related to weight differential (Pearson $r = -.27$). Both groups exhibited rapidly declining coverant frequency rates during the course of treatment. But on an overall basis, Group 4 experienced significantly more coverants than did Group 3 ($p < .05$).

Coverant conditioning appears to be a viable therapeutic adjunct. However, the applicability of the Premack principle in a self-management situation was not established.

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APPENDICES

APPENDIX A

LETTER TO PHYSICIANS REQUESTING REFERRALS

LETTER TO PHYSICIANS REQUESTING REFERRALS

MICHIGAN STATE UNIVERSITY

Health Center

INTER-DEPARTMENTAL CORRESPONDENCE

To: Health Center Staff Date: February 24, 1970

From: Mary H. Ryan, M. D. Subject: see below

For his doctoral dissertation in counseling, J. J. Horan is testing the application of a learning theory derivative in the treatment of obesity. This study will dovetail nicely with our existing weight loss programs.

Please send prospective patients to Office 1 for the application-questionnaire. Though all will be treated, we are particularly interested in obtaining 100 females who are between 20% and 30% overweight.

It is essential that the applicants receive no other treatment besides that offered by the program, and that they remain as naive as possible (i.e. that they do not know they are part of a "study.")

Thank you very much for your cooperation.

APPENDIX B

NEWSPAPER ANNOUNCEMENTS

Russian and East European Studies Group will present a film, tonight, 7:00 p.m., 107 S. Kedzie, entitled "Virgin."

SDS will hold a meeting tonight, 8:30 p.m., Old College Hall, Union.

Orchesis the Modern Dance Club will hold a meeting tonight, 7:00 p.m., Womens I.M., Dance Studio.

"Save up to 20% . . . Sell your books directly to students. All-U Book Exchange in Shaw Hall Lower Lounge begins Monday, March 30th. We will collect books noon to 6 p.m., Tuesday through Friday of finals week — and during spring term registration (March 30, 31). Winter term we helped students exchange $7,000 worth of books; Maybe we can help YOU spring term."

A weight control counseling program will be conducted at Olin Health Center during the spring quarter. Those wishing to participate should apply in Office No. 1, tonight between 7:00 and 8:30 p.m.

The Winged Spartans will have a presentation by Roger Odell, Eastern Flight Engineer, about traveling spots, air safety, airlines, and pilot careers. Several films will be shown, tonight, 7:30 p.m., Rm 38 - 39 Union.

Cotton Lite - the weekly meeting of Campus Crusade for Christ, will meet tonight, 9:13 p.m. in S. Wonders Lower Lounge. Larry Tregoning - captain of the 1965 top-ranked U. of M. basketball team will speak. All welcome to attend. For rides call 351-0642.

A special stage performance of "The Apple Pie and White Picket Fences Carnival Show" will be presented tonight, 8:00 p.m., Wonders Kiva. The production is presented by MSU Theater and TV majors. Free admission.

New University Conference will hold a meeting, 7:30 p.m., Room 32, Union, this discussion will concern the Detroit geographical expedition and Institute and the program for spring term. Faculty, graduate students and other interested members of the university community are welcome.

Last chance to reserve a spot in one of the weight loss counseling programs being conducted at Olin Health Center during the Spring quarter. Apply tonight in Office No. 1 between 7 and 8 p.m.

The Michigan State Management Club will have a meeting, tonight, 7:00 p.m., Teak Room, Eppley Center. Mr. Barry Brown, Director State of Michigan Department of Labor will speak on "Labor Standards and the Working - Mans Rights."

Snyder Hall duplicate bridge club will present a duplicate bridge tournament tonight, 7:30 p.m., Snyder Hall Cafeteria. Master points will be awarded. Public invited.

"Save up to 20 per cent — Sell your books directly to students. All - U Book Exchange in Shaw Hall Lower Lounge begins Monday, March 30th. We will collect books Noon to 6 p.m., Tuesday through Friday of finals week — And during Spring term registration (March 30, 31). Winter term we helped students exchange $7,000 worth of books; Maybe we can help YOU Spring term."

The Anti - ROTC Committee will meet 8:00 p.m., tonight, Room 34, Union.

Learn to Soar. MSU Soaring Club will be flying March 30 and 31. Stop at our booth at registration for rides to airport. Special introductory meeting April 1 — movie — 7:30 p.m., Room 30, Union. For information call Jim, 353-6931 or Bob, 882-3250.

TONIGHT: HUBBARD HALL presents a dance - concert featuring BACKSTREET and lights by KALEIDOSCOPE, 8:30p.m. Hubbard Hall classrooms, $.50 admission.

The graduate History Wives Club will meet tonight, 7:30 p.m., at the home of Mrs. Madison Kuhn, 404 Cowley, East Lansing. Jean Oelslighe will speak on "The Peace Corps in Peru."

Free air, Free Newspapers, free people, free women's liberations literature and free TRASH at the MAN AND NATURE BOOKSTORE. Open 9 a.m. to 5 p.m. on Monday through Friday and !!! now open 12 to 6 p.m. on Saturday. MAN AND NATURE BOOKSTORE is located on the third floor of the Student Services Building. On Saturday the elevators don't run so use the stairs at the west side of the building.

Dr. J. Stieber, School of Labor and Industrial Relations will speak on "Industrial Relations and Manpower in Israel, tonight, 7:30 to 9:30 p.m., this is the final lecture in the Free University series ISRAEL: A Model for Social Change.

Thursday, March 12, 1970

Tuesday, March 10, 1970

APPENDIX C

QUESTIONNAIRE 1

(APPLICATION BLANK)

QUESTIONNAIRE 1

Application Blank

Name _____ Sex _____ Age _____ Class _____

Local Address _____ Local Phone _____

Home Address _____ Home Phone _____

Height _____ Weight _____

What weight do you think you would like to be? _____

How long have you been overweight? _____

Have you ever seriously tried to lose weight before? _____

How often? _____

Are you married? _____ If so, is your spouse overweight? _____
OR
Are you dating anyone in particular? _____

Is this person overweight? _____

Are (were) your parents overweight? Mother _____ Father _____

How many brothers and sisters do you have? _____

How many are overweight? _____

What is your approximate family income? _____ per year.

Religious preference _____ Ethnic group _____

Applicant's comments (if any):

Physician's comments:

APPENDIX D

QUESTIONNAIRE 2

QUESTIONNAIRE 2

The main purpose of this questionnaire is to get you thinking about why you might want to lose weight. All of your responses are confidential and will not be duscussed with anyone other than you and the staff member assigned to your case at the clinic.

Please fill it out at your leisure. It is not essential that you answer every item. Try to express your real feelings whenever possible.

Bring the completed questionnaire with you to your interview on:

Please indicate below as many of the negative aspects about being overweight that you can think of. These may range from completely conventional stereotypes such as "shortness of breath" to purely personal fears such as "losing the interest of one's spouse." Several examples are listed.

_____ 1. I could die long before my time because of being overweight.

_____ 2. I have a hard time finding clothes to fit.

_____ 3. _____ (some person) would be repulsed by the sight of me in a bathing suit.

_____ 4.

_____ 5.

_____ 6.

_____ 7.

_____ 8.

_____ 9.

_____ 10.

_____ 11.

_____ 12.

_____ 13.

_____ 14.

_____ 15.

_____ 16. Describe the most horrible fantasy or daydream related to being overweight that you can think of:

Can you think of any other very uncomfortable experiences (real or imaginary) having to do with being overweight?

_____ 17.

_____ 18.

Now, please indicate as many positive aspects about being properly proportioned that you can think of. Some of these may be just the opposite of the negative aspects you have already listed. Others may be completely different. Several examples are given.

_____ 1. Members of the opposite sex will find me attractive.

_____ 2. Perspiration won't be much of a problem anymore.

_____ 3. I'll feel better in every way.

_____ 4.

_____ 5.

_____ 6.

_____ 7.

_____ 8.

_____ 9.

_____ 10.

_____ 11.

_____ 12.

_____ 13.

_____ 14.

_____ 15.

_____ 16. Describe the most desirable fantasy or daydream related to being properly proportioned that you can think of:

Can you think of any other very pleasant experiences (real or imaginary) having to do with being properly proportioned?

_____ 17.

_____ 18.

ON THE LINE IN THE LEFT MARGIN WRITE DOWN EXACTLY HOW OFTEN EACH OF THESE NEGATIVE AND POSITIVE THOUGHTS OCCURRED TO YOU DURING THE PAST 24 HOURS, PRIOR TO YOUR READING OF THIS QUESTIONNAIRE.

If these thoughts did not occur during this 24 hour period, use the following code to describe their average frequency:

a. never
b. once a month
c. once a week
d. once a day
e. twice a day
f. three or more times a day

APPENDIX E

QUESTIONNAIRE 3

QUESTIONNAIRE 3

The following list contains a variety of activities which you may engage in frequently each day, either out of habit or because they are somehow rewarding to you.

1. combing your hair
2. reading textbooks
3. washing your hands
4. putting on a coat
5. using the lavatory
6. leaving a classroom
7. watching television programs
8. entering your bedroom
9. sitting down on a particular chair
10. looking at your reflection in a mirror

Notice that each activity listed is fairly precise. "Getting dressed" is not listed, but "putting on a coat" is. "Sitting down" in general is not listed, but "sitting on a particular chair (e.g. an office chair or a favorite green recliner)" is.

Such a list could be endless! Think of some more activities related to your life as an individual and write them down below. (Do not include eating or behaviors related to eating such as drinking Coke, chewing gum, or smoking cigarettes.)

1.

2.

3.

4.

5.

Now, from the combined lists, select 3 activities which you know to occur at least 7 times a day.

Activity	Column A	Col. X	Col. Y	Col. Z
1.				
2.				
3.				

In Column A write down the number of times these activities occurred during the past 24 hours.

YOU ARE NOW ASKED TO KEEP TRACK OF HOW OFTEN THESE ACTIVITIES OCCUR DURING THE NEXT 3 DAYS. In Column X write down the number of times you engage in each activity during the next 24 hours. Column Y should contain the number of times each activity occurs in the following 24 hour period. Column Z should indicate the frequency of each behavior in the final 24 hour period.

APPENDIX F

QUESTIONNAIRE 4

QUESTIONNAIRE 4

Exact answers to the following questions would, of course, be impossible. But please try to respond as accurately as you can.

During the first week of the program you thought of the "negative and positive" aspect pairs about _____ times per day.

Did you continue thinking of these pairs beyond the first week? _____ If no, please answer why on the back of this sheet.

If yes, how often (per day average) did you think of these pairs during the

second week? _____ sixth week? _____

third week? _____ seventh week? _____

fourth week? _____ eighth week? _____

fifth week? _____

How intensely did you experience the emotions surrounding these thoughts? In other words, how emotionally involved did you get with the idea behind the words?

1	2	3	4	5
very low	low	medium	high	very high

during the first week? _____ during the fifth week? _____

during the second week? _____ during the sixth week? _____

during the third week? _____ during the seventh week? _____

during the fourth week? _____ during the eighth week? _____

Did you add new thought pairs that you felt would motivate you? _____

How many? _____

Did you ignore any thought pairs which you felt were no longer motivating? _____ How many? _____

APPENDIX G

QUESTIONNAIRE 5

QUESTIONNAIRE 5

Exact answers to the following questions would, of course, be impossible. But please try to respond as accurately as you can.

You selected _____ as your highly probable neutral behavior.

During the first week of the program you made this behavior depend upon thinking the "negative and positive" thought pairs about _____ times per day.

Did you continue this system beyond the first week? If no, please answer why on the back of this sheet.

If yes, how often (per day average) did you think of these pairs during the

second week? _____ sixth week? _____

third week? _____ seventh week? _____

fourth week? _____ eighth week? _____

fifth week? _____

How intensely did you experience the emotions surrounding these thoughts? In other words, how emotionally involved did you get with the idea behind the words?

1	2	3	4	5
very low	low	medium	high	very high

during the first week? _____ during the fifth week? _____

during the second week? _____ during the sixth week? _____

during the third week? _____ during the seventh week? _____

during the fourth week? _____ during the eighth week? _____

Did you add new thought pairs that you felt would motivate you? _____

How many? _____

Did you ignore any thought pairs which you felt were no longer motivating? _____ How many? _____

APPENDIX H

TREATMENT BOOKLET

So

You Want

To Lose Weight

S E N S E A N D N O N S E N S E

A B O U T O B E S I T Y

J. J. Horan
Olin Health Center
Michigan State University
1970

SOME MYTHS:

You may have heard people say:

"She eats all day and doesn't gain an ounce."

or

"Everything he eats turns to fat."

Such talk is utter nonsense! What goes into the body is either used up and excreted, or stored "for a rainy day" as fat.

You may have heard other people say:

"He is fat because he has gland troubles."

or

"Psychological problems caused her to gain weight."

This kind of talk is 99% nonsense! True, some overweight individuals have gland troubles and psychological problems as well. But so do a lot of skinny people! These disturbances do not cause obesity; they only complicate it. Obesity is a condition arising only from eating more than is necessary over a prolonged period of time.

SOME FACTS:

OBESITY OCCURS ONLY WHEN CALORIC INTAKE CONSISTENTLY EXCEEDS CALORIC EXPENDITURE!

People do differ from each other insofar as their minimum daily food requirements are concerned. It's obvious that a lumberjack must consume more than a fashion model in order to survive.

Furthermore, the daily caloric needs of a given individual may vary with the climate, his activity level, and a host of other factors.

But obesity occurs only when one consistently exceeds his own particular food requirements.

Now you may wonder why some people eat more than they have to.

Lazyness, gluttony, or lack of will power have nothing to do with it!

Some people eat more than is necessary simply because they have developed any one or more of what can be called "MALADAPTIVE EATING HABITS." We call these habits maladaptive because their end result (obesity) is highly undesirable.

We do not always know how or why an overweight individual acquired his own particular system of maladaptive eating habits. All that can be said is that he learned them some time in his life. A hundred different people could have picked up the same bad habit from any one of a hundred different causes.

Curiously enough, most of these habits may not even be known to the person who has them. But becoming aware of them is the first step toward breaking them!

See how many of these maladaptive eating habits sound familiar to you. Notice that many of them involve eating, not as a result of hunger pangs, but as a response to something else.

THE MALADAPTIVE HABITS:

1. Non-Stop Nibbling and Easily-Eatable Food Storing

Non-stop nibbling is a maladaptive eating habit which can't possibly occur without the existence of another equally bad habit, namely, keeping food around the house which doesn't require preparation.

Many overweight people tend to surround themselves with easily-eatable food. Candy dishes abound; cashew trays overflow. Cupboards are packed with popcorn, pretzels, potato chips, and sundry other munchie-crunchies.

Rationalizations are equally as legion. "It's left over from a party" or "I keep it around for visitors" are frequently heard excuses.

Yet a simple fact remains: Alcoholics living in wine cellars can't be cured. Neither can overweight people living in food storage bins!

Are you a non-stop nibbler? Yes No
Do you keep around a lot of easily-eatable food? Yes No

2. Eating Rapidly

Have you ever left a Thanksgiving dinner table feeling comfortably full, only to experience later on in the evening the sensation of being more stuffed than the turkey you ate?

Many overweight people have a vague awareness of this phenomenon, which may occur to a lesser extent on a daily basis. Most, however, haven't the faintest idea as to what causes it. If pressed for an explanation they might even reply "I didn't mean to eat so much" or "I thought I stopped eating when I was full."

Both excuses may be true! Overweight people, particularly those on diets, have been observed to eat much more rapidly than those of normal weight. Since it takes about 15 minutes after beginning to eat before one starts to feel the effects of his food, we can say that it takes at least 15 minutes after one stops before he feels the full effects of his meal.

Because the amount you eat varies directly with how fast you eat, it's quite possible to unknowingly gorge yourself in a very short period of time.

Do you eat rapidly? Yes No

3. Eating Everything On Your Plate

Using such verbal sledgehammers as "It's a sin to waste food" or "The poor people in Korea would love that potato," many mothers succeed in cultivating the "clean plate" habit among their offspring.

Hence many children grow into adulthood still letting the quantity of food placed before them rather than the quality of the hunger within them determine how much they eat. In fact a few unfortunate individuals are so indoctrinated that they suffer severe pangs of guilt if even the smallest morsel of food has to be thrown out.

In this age of affluence an astronomical number of automobiles are junked every year. Expensive, still-wearable wardrobes are given away or stored unused simply because of slight changes in style. The United States produces more than four times the amount of food required to sustain its population. It makes no sense to save a few cents worth of over-nourishment and thereby incur the incredible health expense of obesity.

(Of course, if cost is a factor, it's always possible to keep the left-overs for another meal, rather than finish them off in a hasty gulp.)

Do you have the habit of cleaning the plate, regardless of how hungry you are? Yes No

4. Eating As A "Non-Pure" Experience

Psychological learning theory tells us that if two events repeatedly occur at the same time, one is apt to become a stimulus for the other.

If you frequently eat while you read, thumbing through a textbook may, in itself, become a stimulus for eating. If you snack while watching T.V., the "boob-tube" alone (not your stomach), may send you scurrying for a sandwhich.

Do you combine eating with other activities? Yes No

5. Eating When Anxious

Psychologists have classified several kinds of anxiety. But for our purposes we can briefly describe the anxious individual as a person who is "up tight" about something.

We've all been anxious many times in our lives; it's an uncomfortable, but inescapable experience. And we all have our own pet ways of reducing anxiety.

For example, let's say you're anxious about an exam. You've been studying for hours and you just can't look at the book any longer. You need to take a break, at least for a while. What do you do?

1. Turn on the T.V.
2. Go to sleep
3. Take a walk
4. Visit a friend
5. Grab a bite to eat

All five choices probably sound familiar. You might even combine numbers 3, 4, and 5 by heading down to the Grille for a snack. But did you know that a pie and coffee study break may be the caloric equivalent of a steak and a large potato? Many overweight people frequently choose eating (and not some other activity) as a means of reducing anxiety.

Do you eat when you get anxious? Yes No

6. Eating When Lonely Or Depressed

The popular idea that fat people are friendly, happy-go-lucky, and without a care in the world is a delusion!

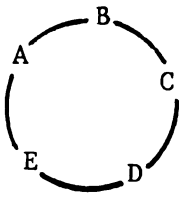
True, some overweight people are personally content and

socially well adjusted, but many more obese individuals frequently experience the painful feelings of loneliness and depression.

Though overweight men and women do not have a corner on the sadness market (those of normal weight can be just as unhappy), many obese individuals do have the maladaptive habit of eating as soon as they begin to feel lonely or depressed.

Since eating can be a powerful anesthetic for this kind of mental anguish, a vicious circle can easily develop. Take the case of Kathy:

A. Kathy was rejected by a boy.
B. She then felt lonely and depressed.
C. Kathy found (subconsciously) that eating could soothe these painful feelings.
D. But this kind of eating caused her to gain weight.
E. The additional weight increased Kathy's likelihood of being rejected in the future.



The vicious circle could easily be broken at point "C" if only Kathy would find some other way of handling her mental pains.

Do you eat when you feel lonely or depressed? Yes No

A WEIGHT LOSS ACTION PROGRAM:

Losing weight (and keeping it off) requires concentrated effort in two areas:

1. Limiting your caloric intake (dieting)
2. Breaking your maladaptive eating habits

After you're down to your goal weight you can begin eating comfortably (but sensibly!) again. And as long as you don't resume the bad habits you won't regain the weight.

A successful weight control program should employ many of the following procedures. Adopt whatever suggestions you feel will help you lose weight and keep from regaining it.

1. Familiarize yourself with the dietary information contained in the 1000 Calorie Daily Menu Guide. Plan your meals accordingly.

2. Get a good scale. Weigh yourself three times daily. Post the weight range sheet on the wall directly above the scale. Write down the time of day, your condition (e.g. clothed?, after eating?, etc.), and your weight, after each weighing.

3. Remove food from all places in your house except the kitchen.

4. With the possible exception of the foods on List 1 of the 1000 Calorie Daily Menu Guide, toss out, give away, or otherwise dispose of any food which doesn't require preparation. (And don't buy any more!)

5. Reserve one spot in your residence for eating. If possible, eat nowhere else.

6. Slow down your rate of eating. You might try interrupting your meal for two-minute intervals. And don't gulp! Focus on the flavor of the food.

7. Prepare (or take) smaller portions. It's better to get a second helping that you want than it is to clean your plate when you're not really hungry. (Also, if you have to think about getting seconds, then you're not as likely to do so!)

8. Make eating a "pure" experience. Do not combine eating with any other activity.

9. Feeling anxious? Turn on the T.V. Take a walk. Work on a hobby. Try some exercises. Anything but eating!

10. Feeling lonely or depressed? Visit a friend and talk it over. Immerse yourself in some group activity. But don't eat!

WEIGHT RANGE SHEET

Day & Time Condition Weight	Day & Time Condition Weight	Day & Time Condition Weight
1 Morn. Noon Eve.	19	37
2 M N E	20	38
3 M N E	21	39
4 M N E	22	40
5 M N E	23	41
6 M N E	24	42
7 M N E	25	43
8 M N E	26	44
9 M N E	27	45
10 M N E	28	46
11 M N E	29	47
12 M N E	30	48
13 M N E	31	49
14 M N E	32	50
15 M N E	33	51
16 M N E	34	52
17 M N E	35	53
18 M N E	36	54

1000 calories

carbohydrate	90 Gm.
protein	60 Gm.
fat	45 Gm.

Daily menu guide

The foods allowed in your diet should be selected from the seven exchange lists on this page. Menus should be planned on the basis of the menu guide given below. Foods in the same list are interchangeable, because, in the quantities specified, they provide approximately the same amounts of carbohydrate, protein, and fat. For example, when your menu calls for one bread exchange, any item in List 4 may be used in the amount stated. If two bread exchanges are allowed, double the specified amount or use a single exchange of *two* foods in List 4. Sample menus on the reverse side of this sheet illustrate correct use of the exchange lists.

BREAKFAST
1 fruit exchange (List 3)
1 bread exchange (List 4)
2 meat exchanges (List 5)
1/2 milk exchange (List 7)
Coffee or tea (any amount)

LUNCH
2 meat exchanges (List 5)
1 bread exchange (List 4)
Vegetable(s) as desired (List 1)
1 fruit exchange (List 3)
1/2 milk (skimmed) exchange (List 7)
1 fat exchange (List 6)
Coffee or tea (any amount)

DINNER
2 meat exchanges (List 5)
1 bread exchange (List 4)
Vegetable(s) as desired (List 1)
1 vegetable exchange (List 2)
1 fruit exchange (List 3)
1 fat exchange (List 6)
Coffee or tea (any amount)

List 1 allowed as desired

(need not be measured)

Seasonings: Cinnamon, celery salt, garlic, garlic salt, lemon, mustard, mint, nutmeg, parsley, pepper, saccharin and other sugarless sweeteners, spices, vanilla, and vinegar.

Other Foods: Coffee or tea (without sugar or cream), fat-free broth, bouillon, unflavored gelatin, rennet tablets, sour or dill pickles, cranberries (without sugar), rhubarb (without sugar).

Vegetables: Group A—insignificant carbohydrate or calories. You may eat as much as desired of raw vegetable. If cooked vegetable is eaten, limit amount to 1 cup.

Asparagus	Lettuce
Broccoli	Mushrooms
Brussels sprouts	Okra
Cabbage	Peppers, green or red
Cauliflower	Radishes
Celery	Sauerkraut
Chicory	String beans
Cucumbers	Summer squash
Eggplant	Tomatoes
Escarole	Watercress
Greens: beet, chard, collard, dandelion, kale, mustard, spinach, turnip	

List 2 vegetable exchanges

Each portion supplies approximately 7 Gm. of carbohydrate and 2 Gm. of protein, or 36 calories.

Vegetables: Group B—One serving equals 1/2 cup, or 100 Gm.

Beets	Pumpkin
Carrots	Rutabagas
Onions	Squash, winter
Peas, green	Turnips

List 3 fruit exchanges

(fresh, dried, or canned without sugar)

Each portion supplies approximately 10 Gm. of carbohydrate, or 40 calories.

	household measurement	weight of portion
Apple	1 small (2" diam.)	80 Gm.
Applesauce	1/2 cup	100 Gm.
Apricots, fresh	2 med.	100 Gm.
Apricots, dried	4 halves	15 Gm.
Banana	1/2 small	50 Gm.
Berries	1 cup	140 Gm.
Blueberries	2/3 cup	100 Gm.
Cantaloupe	1/4 (6" diam.)	200 Gm.
Cherries	10 large	75 Gm.
Dates	2	15 Gm.
Figs, fresh	2 large	50 Gm.
Figs, dried	1 small	15 Gm.
Grapefruit	1/2 small	125 Gm.
Grapefruit juice	1/2 cup	100 Gm.
Grapes	12	75 Gm.
Grape juice	1/4 cup	60 Gm.
Honeydew melon	1/8 (7")	150 Gm.
Mango	1 small	70 Gm.
Orange	1 small	100 Gm.
Orange juice	1/2 cup	100 Gm.
Papaya	1/3 med.	100 Gm.
Peach	1 med.	100 Gm.
Pear	1 small	100 Gm.
Pineapple	1/2 cup	80 Gm.
Pineapple juice	1/3 cup	80 Gm.
Plums	2 med.	100 Gm.
Prunes, dried	2	25 Gm.
Raisins	2 tbsp.	15 Gm.
Tangerine	1 large	100 Gm.
Watermelon	1 cup	175 Gm.

List 4 bread exchanges

Each portion supplies approximately 15 Gm. of carbohydrate and 2 Gm. of protein, or 68 calories.

	household measurement	weight of portion
Bread	1 slice	25 Gm.
Biscuit, roll	1 (2" diam.)	35 Gm.
Muffin	1 (2" diam.)	35 Gm.
Cornbread	1 1/2" cube	35 Gm.
Flour	2 1/2 tbsp.	20 Gm.
Cereal, cooked	1/2 cup	100 Gm.
Cereal, dry (flakes or puffed)	3/4 cup	20 Gm.
Rice or grits, cooked	1/2 cup	100 Gm.
Spaghetti, noodles, etc.	1/2 cup	100 Gm.
Crackers, graham	2	20 Gm.
Crackers, oyster	20 (1/2 cup)	20 Gm.
Crackers, saltine	5	20 Gm.
Crackers, soda	3	20 Gm.
Crackers, round	6-8	20 Gm.
Vegetables Beans (Lima, navy, etc.), dry, cooked	1/2 cup	90 Gm.
Peas (split peas, etc.), dry, cooked	1/2 cup	90 Gm.
Baked beans, no pork	1/4 cup	50 Gm.
Corn	1/3 cup	80 Gm.
Parsnips	2/3 cup	125 Gm.
Potato, white, baked or boiled	1 (2" diam.)	100 Gm.
Potatoes, white, mashed	1/2 cup	100 Gm.
Potatoes, sweet, or yams	1/4 cup	50 Gm.
Sponge cake, plain	1 1/2" cube	25 Gm.
Ice cream (Omit 2 fat exchanges)	1/2 cup	70 Gm.

List 5 meat exchanges

Each portion supplies approximately 7 Gm. of protein and 5 Gm. of fat, or 73 calories. (30 Gm. equal 1 oz.)

	household measurement	weight of portion
Meat and poultry (beef, lamb, pork, liver, chicken, etc.) (med. fat)	1 slice (3" x 2" x 1/8")	30 Gm.
Cold cuts	1 slice (4 1/2" sq., 1/8" thick)	45 Gm.
Frankfurter	1 (8-9 per lb.)	50 Gm.
Codfish, mackerel, etc.	1 slice (2" x 2" x 1")	30 Gm.
Salmon, tuna, crab	1/4 cup	30 Gm.
Oysters, shrimp, clams	5 small	45 Gm.
Sardines	3 med.	30 Gm.
Cheese, cheddar, American	1 slice (3 1/2" x 1 1/2" x 1/4")	30 Gm.
Cheese, cottage	1/4 cup	50 Gm.
Egg	1	50 Gm.
Peanut butter	2 tbsp.	30 Gm.

Limit peanut butter to one exchange per day unless allowance is made for carbohydrate in the diet plan.

List 6 fat exchanges

Each portion supplies approximately 5 Gm. of fat, or 45 calories.

	household measurement	weight of portion
Butter or margarine	1 tsp.	5 Gm.
Bacon, crisp	1 slice	10 Gm.
Cream, light	2 tbsp.	30 Gm.
Cream, heavy	1 tbsp.	15 Gm.
Cream cheese	1 tbsp.	15 Gm.
French dressing	1 tbsp.	15 Gm.
Mayonnaise	1 tsp.	5 Gm.
Oil or cooking fat	1 tsp.	5 Gm.
Nuts	6 small	10 Gm.
Olives	5 small	90 Gm.
Avocado	1/8 (4" diam.)	25 Gm.

List 7 milk exchanges

Each portion supplies approximately 12 Gm. of carbohydrate, 8 Gm. of protein, and 10 Gm. of fat, or 170 calories.

	household measurement	weight of portion
Milk, whole	1 cup	240 Gm.
Milk, evaporated	1/2 cup	120 Gm.
*Milk, powdered	1/4 cup	35 Gm.
*Buttermilk	1 cup	240 Gm.

*Add 2 fat exchanges if milk is fat-free.

1000 calories (approximately)

carbohydrate	90 Gm.
protein	60 Gm.
fat	45 Gm.

General Rules

Measuring Food

Food should be measured. You will need a standard 8-ounce measuring cup and a measuring teaspoon and tablespoon. All measurements are level. Most foods are measured after cooking.

Food Preparation

Meats should be baked, boiled, or broiled. Do not fry foods unless fat allowed in meal is used.

Vegetables may be prepared with the family meals, but your portion should be removed before extra fat or flour is added.

Special Foods

It is not necessary to buy special foods. Select your diet from the same foods purchased for the rest of the family—milk, vegetables, bread, meats, fats, and fruit (fresh, dried, or canned without sugar). "Special dietetic foods" should be thoroughly investigated and usually must be figured in the diet.

Foods to Avoid

Sugar	Pie
Candy	Cake
Honey	Cookies
Jam	Pastries
Jelly	Condensed Milk
Marmalade	Soft Drinks
Syrups	Candy-Coated Gum

Fried, scalloped, or creamed foods

Beer, wine, or other alcoholic beverages

Eat only those foods which are on diet list.

Eat only the amounts of foods on diet.

Do not skip meals.

Do not eat between meals.

The use of the exchange list is based upon the recommendation of the American Diabetes Association and The American Dietetic Association in co-operation with the Diabetes Branch of the U.S. Public Health Service, Department of Health, Education, and Welfare.

Liquid Diets

(May be used to replace any one of the meals)

Full Liquid

Eggnog { milk.....1/2 cup.....120 Gm.
egg.....1..... 50 Gm.
Orange juice.....3/4 cup.....150 Gm.
Milk.....3/4 cup.....180 Gm.

Clear Liquid

Clear bouillon.....1 cup
Orange juice.....1 cup.....200 Gm.
Gelatin dessert.....1/2 cup.....100 Gm.

Bedtime Feeding

(Only when directed by physician)

1/2 milk exchange (1/2 cup milk) + 1/2 bread exchange (2 crackers) } will add approximately 120 calories to daily diet

Eli Lilly and Company
Indianapolis, Indiana 46206

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Daily Menu Guide

These sample menus show some of the ways that the exchange lists may be used to add variety to your meals. Use the exchange lists on the back of this sheet to plan different menus.

BREAKFAST

1 fruit exchange (List 3)
1 bread exchange (List 4)
2 meat exchanges (List 5)
1/2 milk exchange (List 7)
Coffee or tea (any amount)

BREAKFAST EXAMPLE

Orange juice.....1/2 cup
Toast.....1 slice
Eggs.....2
Milk, whole.....1/2 cup

LUNCH

2 meat exchanges (List 5)
1 bread exchange (List 4)
Vegetable(s) as desired (List 1)
1 fruit exchange (List 3)
1/2 milk (skimmed) exchange (List 7)
1 fat exchange (List 6)
Coffee or tea (any amount)

LUNCH EXAMPLE

Meat.....2 slices (3" x 2" x 1/8" ea.)
Broccoli.....as desired
Lettuce and tomato salad.....as desired
Bread.....1 slice
Butter.....1 tsp.
Pineapple.....1/2 cup
Milk, skimmed.....1/2 cup

DINNER

2 meat exchanges (List 5)
1 bread exchange (List 4)
Vegetable(s) as desired (List 1)
1 vegetable exchange (List 2)
1 fruit exchange (List 3)
1 fat exchange (List 6)
Coffee or tea (any amount)

DINNER EXAMPLE

Tomato juice.....3 oz.
Chicken.....2 slices (3" x 2" x 1/8" ea.)
Noodles.....1/2 cup
Asparagus.....as desired
Peas.....1/2 cup
Butter.....1 tsp.
Banana.....1/2 small

APPENDIX I

SCRAP SHEET

NEGATIVE ASPECTS	POSITIVE ASPECTS
1. Obesity	1. Properly Proportioned
2. Overweight	2. Normal Weight
3. Being Fat	3. Being Trim
4. Chubbiness	4. Slimness
5. Extra Weight	5. Well Distributed Weight
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.

APPENDIX J

DISPLAY PACKET

DISPLAY PACKET